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THE LESS YOU KNOW: THE UTILITY OF AMBIGUITY AND UNCERTAINTY IN COUNTER-TERRORISM

by

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March 2015

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Strategies of Cold War nuclear deterrence are examined and specific instances of the advantages of uncertainty are identified. Ambiguity and uncertainty are defined and described in detail, and examples of how they might be used are discussed. This thesis concludes that greater terror threats warrant greater use of strategies employing uncertainty on the part of one's enemies and oneself.

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THE LESS YOU KNOW: THE UTILITY OF AMBIGUITY AND UNCERTAINTY IN COUNTER-TERRORISM

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I. INTRODUCTION

A. STATEMENT OF THE PROBLEM

Terrorism is a difficult problem for liberal governments with countless—often inconsistent—definitions of the term in use even within single governments. Are terrorists criminals, to be pursued by law enforcement agencies and tried in civil courts? Are they enemies of the state to be battled by military forces and handled entirely by martial justice systems? Is it merely success that moves them from one category to the other? Is ideology a factor in defining who is a terrorist, or is it purely the tactics employed? If the latter, how do we reconcile our support of "freedom fighters" in some places that use the same methods as enemies we are fighting elsewhere? Further complicating the issue, modern open societies demand near-perfect prevention efforts, but the governments of such societies will necessarily be constrained in their counter-terrorism efforts by constitutional checks, transparency laws, and all manner of rules that keep their countries open and free.

In the last decade, thousands of books and articles have been written on terrorism but few if any approach the subject from the direction of uncertainty. Many have considered methods of deterrence, examined individual and group causal factors, and created explanatory and—much less successfully—predictive models. But in nearly every case, the focus is on reducing uncertainty. Whether the goal is predicting the actions of our enemies, improving our intelligence capabilities to reduce chances of strategic surprise, or creating intelligible policies and statements on what our response to terrorism should be, nearly everyone seems to be seeking clarity. This paper, by contrast, endeavors to examine the gray areas between known and unknown, and to determine the circumstances under which a liberal Western-style democracy might benefit from leveraging existing uncertainties or even injecting unpredictability into counter-terrorism policies.

Such an idea is not new, having been discussed extensively by Cold War strategists, but this type of approach fell out of favor as our increase in capabilities far

outpaced those of our enemies, and it was no longer necessary. Our strength of arms and strength of principles has led us to focus more exclusively on power and clarity over cleverness and ambiguity, but this thesis argues that a more nuanced approach may sometimes provide potent advantages.

B. RESEARCH QUESTION

Under what conditions might intentionally ambiguous counter-terrorism policies be advantageous for a powerful Western liberal democracy?

C. LITERATURE REVIEW

1. The Foundering State of Terrorism Studies

For decades, social scientists have lamented the state terrorism studies.[1] Andrew Silke described the situation so:

> It is possible for a research community to remain active indefinitely without ever producing meaningful explanatory results (while tolerating very high levels of conceptual confusion and disagreement). It seems relatively clear that terrorism research exists in such a state and that after over 30 years of enquiry, the field shows little evidence that it is capable of making the leap to consistently producing research of genuine explanatory and predictive value.[2]

Similarly argued by Horgan: "The sheer volume" of works on terrorism cannot mask "its questionable nature."[3] Schmid and Jorgman estimate that 80 percent of the literature is "not research-based in any rigorous sense." Such an assessment appears to be common if not mainstream.

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1. Alex Schmid and Albert Jongman, *Political Terrorism: A New Guide to Actors, Authors, Concepts, Data Bases, Theories and Literature* (Oxford: North Holland 1988), 179; A. Silke (2001) "The Devil You Know: Continuing Problems with Research on Terrorism, *Terrorism and Political Violence*," September, 2010, 13:4, 1–14, DOI: 10.1080/09546550109609697; John Horgan, *The Psychology of Terrorism*, Cass Series; Political Violence (London; New York: Routledge, 2005).; Marc Sageman (March 2014) "The Stagnation in Terrorism Research," *Terrorism and Political Violence*, 26:4, 565–580, DOI: 10.1080/09546553.2014.895649

2. Ibid. Silke, 2.

3. Horgan, *The Psychology of Terrorism*, 26.

The most obvious (though not the most damning) indicator of the lack of clarity in terrorism studies is the many pages that most works on terrorism dedicate to trying to establish an acceptable definition of "terrorism" and "terrorist."[4] Horgan argues that the same boundary problems often discussed when writing about terrorism are nearly universal, but other disciplines do not find themselves stymied by this problem.[5] Scholars consistently offer the same reasons for the failure of terrorism studies to advance, but it seems that little progress is being made in addressing them.[6]

2. Looking to Past Successes

Many have argued that the United States is going through a revolution of security doctrine to address the rapidly evolving balance of power worldwide.[7] The last time the U.S. had a major paradigm shift in security was in the adaptation to the new nuclear world early in the Cold War. Much work was done at the time by Thomas Schelling, Warner Schilling, Herman Kahn, Henry Kissinger, Martin Halperin, and others on studying the implications of different strategies. Generally rigorous and often based in the cutting-edge mathematics and social sciences of their time, the works of these individuals stand in stark contrast to most present attempts to develop comprehensive counter-terrorism strategies.

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4. Ibid., 25–27.

5. Ibid., 26.

6. Reasons given by Silke, Horgan, Sageman, Schmid and Jorgman include the emotionally charged nature of the topic; the inaccessibility of many individuals whose availability for study would advance the discipline, and the danger of finding/interviewing them; the overwhelming focus on government "firefighting" policies that are but a small piece of any effective counterterrorism response; a refusal by many to accept that terrorism is a rational behavior and that terrorists are usually rational agents who can be receptive to negotiation; an overreliance on technological solutions by many of those who accept the rationality of terrorists; the tendency of government intelligence agencies that have new and useful data to overclassify it and not share it; the inability of intelligence agencies that have this data to do rigorous academic work; the overreliance of academics on open source and re-worked old public data; and the simple fact that terrorism is a complex issue without any silver-bullet solutions.

7. E.g., Philip Bobbitt, *Terror and Consent: The Wars for the Twenty-First Century*, 1st Anchor Books ed (New York: Anchor Books, 2009).

Lawrence Freedman, *Strategy: A History* (Oxford University Press, 2013).

General Rupert Smith, *The Utility of Force* (Knopf Doubleday Publishing Group, 2007).

Cold War military theorists based their arguments in game theory and information theory, which have seen much advancement in the intervening years. Although many social scientists have attempted to apply their own discipline's tools to the study of terrorism, little has come of their efforts and only a few have developed any detailed applications of game and information theories. Most of those attempts have been both too specific and not specific enough, with most authors applying rigorous methods to particular problems in counterterrorism (e.g., smallpox vaccination), but using such limited and/or estimated inputs that their outputs are not very informative.[8]

This paper attempts to examine how one approach from Cold War strategy—namely the study of uncertainty and asymmetric information around Cold War deterrence and war-fighting nuclear strategies—might be applied to terrorism studies. Because of the limited scope of this project and my lack of access to new information, this paper will likely suffer from many of the same shortcomings identified by Silke and Sageman in Note 7 above, but I will avoid all the pitfalls where possible, and try to point out the ones I cannot.

3. The Study of Deterrence

The first book on modern game theory, by John von Neumann and Oskar Morgenstern, was published in 1944.[9] This coincided with the deployment of nuclear weapons, the massive growth of the academy as a public institution in the U.S., and the beginning of heavy involvement of social scientists in the development of security strategy. By the end of World War II, the nation's military postgraduate institutions were growing rapidly;[10] the RAND Corporation was established to do research to benefit "the

8. Alyson G. Wilson, Gregory D. Wilson, and David H. Olwell, eds., *Statistical Methods in Counterterrorism: Game Theory, Modeling, Syndromic Surveillance, and Biometric Authentication* (New York: Springer, 2006); Daniel G. Arce M. and Todd Sandler, "Counterterrorism: A Game-Theoretic Analysis," The Journal of Conflict Resolution, Vol. 49, No. 2, *The Political Economy of Transnational Terrorism* (Apr., 2005), 183–200.

9. John von Neumann and Oskar Morgenstern, *Theory of Games and Economic Behavior* (Princeton University Press, 1944).

10. "NPS History," Naval Postgraduate School, accessed February 8, 2015, http://www nps.edu/About/NPSHistory/History html.

public welfare and security;"[11] and a system of national laboratories began to research the gamut of security and social issues.[12] This confluence of factors seems to have fostered an ideal environment for this work; a massive body of academic work and stunning advances in social science applications to security theory occurred in just two decades.

The U.S. had recently ended the most deadly and destructive conflict in human history, before or since, by unleashing the most powerful weapon the world had ever seen. It was clear soon after the war that our enemies were developing weapons of similar power, so addressing the issue of how to prevent nuclear war became a truly existential problem. Many brilliant men and women dedicated their careers to addressing this issue. Perhaps foremost among them was Thomas Schelling, whose *Strategy of Conflict*[13] is "a masterpiece that should be recognized as one of the most important and influential books in social theory."[14] An economist by training, Schelling was the first to apply game theory systematically to all manner of security questions; for doing so, he won the Nobel Prize in Economics. He set the stage for later works on the subject by arguing that clashes of will are an inevitable part of the human condition and our efforts are better spent managing them rather than trying to prevent them. Schelling, followed by many others, used game theory to suggest a variety of conceptual tools for managing conflict.[15] "Strength through weakness" is a common theme. Other authors, including Herman

11. "A Brief History of RAND," The RAND Corporation, accessed February 8, 2015, http://www rand.org/about/history/a-brief-history-of-rand.html.

12. "Office of Science History," US Department of Energy, accessed February 8, 2015, http://science.energy.gov/about/history/.

13. Thomas C. Schelling, *The Strategy of Conflict* (Cambridge: Harvard University Press, 1963). Eighteen years newer, Schelling's Micromotives also provides interesting and useful arguments. In it Schelling describes how inferring individual objectives from aggregate group behavior can misleading, especially because individual behaviors are generally selfish but constantly contingent on others' actions. Thomas C. Schelling, *Micromotives and Macrobehavior*, (New York: Norton, 1978).

14. Roger B. Myerson, "Learning from Schelling's Strategy of Conflict," 2009, *Journal of Economic Literature*, 47(4): 1109–25.

15. Schelling, *The Strategy of Conflict*, 3–4.

Kahn,[16] Henry Kissinger,[17] and Roger Hilsman,[18] explore the same issue—managing conflict—through similar frames using both theoretical and practical examples. My arguments will frequently reference the works of these theorists.

4. The "New Terrorism"

The field of terrorism studies is not new. Since the 1960s, researchers from a variety of disciplines have been working to understand how people turn to terrorism and how they might they can be deterred. For this thesis to be viable it has been necessary to attempt a survey—if necessarily incomplete, due to the volume—of the existing literature on terrorism. What follows is a brief description of those readings judged particularly influential or especially relevant to the arguments of this thesis.

In 1979, Paul Wilkinson outlined a method of framing terrorism studies that has been useful in classifying the terrorism research reviewed for this thesis.[19] He described three approaches: "Traditional analytical" writings examine a group's capabilities and objectives to determine the risk they pose. A "speculative" approach reverses the process, asking what targets and types of attacks would be attractive to a group with a given mission and philosophy, allowing for more assumptions to fill in unknowns. Finally, the "crisis management: nontechnical threat assessment" approach works in a more real-time fashion to gather intelligence on threats of the moment and provide recommendations to decision-makers. Each approach has its benefits, but Wilkinson warns against relying too heavily on any one.

In their more rigorous incarnations, all three should be highly "analytical" approaches, carefully employing known data points to build up knowledge or arguments.

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16. Herman Kahn, *On Thermonuclear War* (Princeton University Press, 1960); Herman Kahn, and *Thinking About the Unthinkable* (Horizon Press, 1962).

17. Henry Kissinger, *Diplomacy* (New York: Simon & Schuster, 1994). Argues that we tend to vacillate between idealism and realism (as necessary and as politically viable) and addresses many real life complexities relating to deterrence and credibility throughout modern U.S. history.

18. Roger Hilsman, *From Nuclear Military Strategy to a World without War: A History and a Proposal* (Westport, Conn: Praeger, 1999).

19. Yonah Alexander, David Carlton and Paul Wilkinson, *Terrorism: Theory and Practice* (Boulder, Colo.: Westview Press, 1979).

This breakdown does, however, indicate that there is a spectrum from more analytical to more speculative in terrorism studies, and through the research for this project such a spectrum emerged, if only in the mind of the author.[20] Purely analytic works appear nearly journalistic, examining in great detail the history, actions, and stated intentions of specific terrorists. Conversely, highly speculative work is sometimes little better than an accumulation of tabloid "what-ifs," using only a few confirmed facts to guess at what attacks might be imminent and what responses might be effective.[21]

Analytical research is necessary to lay the groundwork for useful theoretical models, but any modeling necessarily moves into the speculative realm. The product of such models can be more or less analytically grounded, depending on their sources. More analytic examples should inspire more confidence in their results, be they descriptive, predictive or prescriptive in intent.

Inside Terrorism by Bruce Hoffman serves as an example of almost pure analytical writing. It offers an incredibly detailed history of the term *terrorism* and the practice of it in both historical and contemporary contexts. A small number of other works appear to fall into a similar category.[22] This type of research is foundational; whatever its source, it is necessary for any descriptive, predictive or prescriptive models of any value. Similarly, such readings are important in evaluating new perspectives or strategies.

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20. According to the Oxford Dictionaries online, "analyze" means to "Examine methodically and in detail the constitution or structure of (something, especially information), typically for purposes of explanation and interpretation." To "speculate," on the other hand, is to "Form a theory or conjecture about a subject without firm evidence."

21. I should note that these are not at all exclusive categories. One author may shift from one extreme to the other within the same work and indeed within the same paragraph. One can, however, roughly weigh works in their entirety, which I have attempted to do.

22. On the subject of suicide terrorism, Pedahzur's work of the same name fits in this category. Some writings by Brian Jenkins and Jonathan White would as well. I would probably classify *Islamism* by Strindberg and Warn as traditional analytic as well, although it does move into the next category occasionally. This type of work certainly makes up a minority of the literature, perhaps because it requires a large amount of difficult research, builds upon past work rather than creating something entirely new, and is therefore simply less flashy. Ami Pedahzur, *Suicide Terrorism* (Cambridge; Malden, MA: Polity, 2005); Anders Strindberg and Mats Wärn, *Islamism: Religion, Radicalization, and Resistance* (Cambridge, UK; Malden, MA: Polity, 2011); Council on Global Terrorism, *State of the Struggle: Report on the Battle against Global Terrorism*, ed. Lee Hamilton and Justine A. Rosenthal (Washington, D.C: Council on Global Terrorism : Brooking Institution Press [distributor], 2006); Jonathan Randall White, *Terrorism and Homeland Security*, 6th ed (Belmont, CA: Wadsworth Cengage Learning, 2009).

As Wilkinson described decades ago, however, such a perfectly analytic work does not necessarily take the final step into understanding. It is at the edges of traditional analytic, moving into speculative analytic, where sense-making takes place. Better sense-making frameworks are rooted heavily in the more rigorously analytic research described above, and they provide theories that both describe historical happenings and help in understanding continuing events in the present. Often these have a dual footing in another discipline alongside terrorism studies, often sociology or psychology. Good examples include social identity explanations,[23] psychological and psycho/social cause examinations,[24] and psychological/philosophical understandings of the limited rational capacities of individual actors.[25]

Because of their explanatory power, this class of writings is fascinating to read. There is great variety, and notable inconsistency, but a core set of beliefs appears to be held by a vast majority of researchers. Specifically, terrorists are generally psychologically healthy rational actors hoping to achieve specific goals, though their perspective on their actions may be vastly different than ours because of the social context within which they operate. An understanding of their culture and social influences is necessary to understand their motivations. All individuals are also unique, with different mixes of motivations—both selfish and group-oriented—and with distinct sets of available information and differing abilities to process that information. Most people are also likely to share some similar cognitive biases, independent of culture.[26]

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23. Strindberg and Wärn, *Islamism: Religion, Radicalization, and Resistance*; R. Brad Deardorff, *The Roots of Our Children's War: Identity and the War on Terrorism*, 2013; Seth J. Schwartz, Curtis S. Dunkel, and Alan S. Waterman, "Terrorism: An Identity Theory Perspective," *Studies in Conflict & Terrorism* 32, no. 6 (May 2009): 537–59, doi:10.1080/10576100902888453.

24. Tore Bjørgo and John Horgan, eds., *Leaving Terrorism behind: Individual and Collective Disengagement*, Political Violence Series (Milton Park, Abingdon, Oxon ; New York: Routledge, 2009); Tore Bjørgo, ed., *Root Causes of Terrorism: Myths, Reality, and Ways Forward* (London; New York: Routledge, 2005); Fathali M. Moghaddam, *From the Terrorists' Point of View: What They Experience and Why They Come to Destroy* (Westport, Conn: Praeger Security International, 2006); John Horgan, *The Psychology of Terrorism*, Cass Series; Political Violence (London; New York: Routledge, 2005).

25. Bryan D. Jones, "Bounded Rationality," *Annual Review of Political Science* 2 (1999).

26. Nassim Nicholas Taleb, *The Black Swan: The Impact of the Highly Improbable*, 2nd ed., Random trade pbk. ed (New York: Random House Trade Paperbacks, 2010); Sam L Savage, *The Flaw of Averages Why We Underestimate Risk in the Face of Uncertainty* (Hoboken, N.J.: Wiley, 2009), http://www.books24x7.com/marc.asp?bookid=31877; Jonathan Haidt, *The Righteous Mind: Why Good People Are Divided by Politics and Religion* (New York: Vintage Books, 2013).

Yet another step down the speculative path are predictive and prescriptive works, which build off the descriptive models and make specific recommendations. By adding predictive tools, researchers implicitly state that they have a good understanding of the topic; recommending specific courses of actions goes even further by saying one has at least some idea how actions and reactions might play out in the complexity of the real world.[27]

All of these more speculative approaches are important for this thesis in that any judgment of the ideas I will be presenting must be handled within the context of existing sense-making frameworks. If the ideas presented here are irrelevant or inapplicable to various explanatory theories of terrorism, they are probably not worth exploring.

There are a few works that should be addressed more specifically because they will play an important role in this research. First is the limits within which counterterrorism actions should be taken, outlined well by Paul Wilkinson in his 1986 *Terrorism and the Liberal State* and its 2011 "sequel" *Terrorism and Democracy*. Wilkinson states in the latter work that democracies are "extraordinarily resilient" in the face of terrorism.[28] He seems more open to a militaristic response in recent years, though he still says the military should be involved "with reluctance." Several themes remain quite consistent over the years. They include a recommendation that all responses be entirely within the law and without violation of national principles; a warning against overreaction to specific incidents or groups; a need for international bodies and agreements to address the threat; full accountability of counterterrorist agents to civil authorities; and the idea that physical security measures alone will never be enough to prevent terrorism. These recommendations appear consistent with those advocated by most other counterterrorism researchers and are quite relevant to this thesis.

As for what actions to take, a holistic response to preventing terrorism is advocated by Martha Crenshaw. She argued as early as 1983 for a multi-faceted approach

27. Boaz Ganor, an experienced consultant to the Israeli government on counterterrorism, prescribes a number of approaches in his "Guide for Decision Makers." Boaz Ganor, *The Counter-Terrorism Puzzle: A Guide for Decision Makers* (Piscataway, NJ: Transaction Publishers, 2007).

28. Although in 1986, he was not as optimistic.

to terrorism that includes development, governmental reform, police and military response, media and information components, etc. It appears to be one of the earliest arguments for a more modern, holistic, long-term approach to terrorism that is now considered common-sense.[29]

Though written before the 9/11 attacks, a collection of papers by RAND and the University of St. Andrews edited by Ian Lesser offers some interesting and well-framed distinctions. Lesser describes four types of threats terrorists pose to their more "powerful" opponents: direct, indirect, systemic, and war paradigmatic.[30] Such a classification, while non-discrete and somewhat artificial, may be useful in considering different strategies. He also offers a more explicit depiction of the "conflict spectrum" and the increasing space within it that terrorism occupies.

In a related essay, Paul Davis and Brian Jenkins discuss numerous concepts addressed later in this thesis, including co-option and inducement versus deterrence, summarized as the "ladder of coerciveness"; a comparison of Cold War strategy to counterterrorism; internalist versus externalist terrorists (roughly equivalent to the mercenaries and true believers described in more detail by Tore Bjørgo and John Horgan in their works on the psychology of terrorism); decomposition of terrorism motivations and processes, a technique used with success by RAND researchers on drug trafficking and other related issues; and a recognition of the credibility problem of deterrence.[31]

Between them Bjørgo and Horgan have written and edited numerous volumes that are among the best speculative-analytical writings on the subject. Both argue strongly against a "syndrome" view of terrorism in favor of a rational-actor approach, incorporating the social frameworks from which each individual emerges. "Sterile" personality profile descriptions of terrorists are dismissed in favor of a process-oriented approach to analysis, examining experiences and behaviors that are more likely result in

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29. Martha Crenshaw and Irving Louis Horowitz, eds., *Terrorism, Legitimacy, and Power: The Consequences of Political Violence*: Essays, 1st ed (Middletown, Conn. : Scranton, Pa: Wesleyan University Press ; Distributed by Harper & Row, 1983).

30.Ian O. Lesser, ed., *Countering the New Terrorism*, (Santa Monica, CA: Rand, 1999).

31. Paul K. Davis and Brian Michael Jenkins, *Deterrence & Influence in Counterterrorism: A Component in the War on Al Qaeda* (Santa Monica, CA: Rand, 2002).

radicalization and successful terrorist operations. Horgan also discusses the process of disengagement from terrorism, using the same methodology.[32]

A 2005 conference in Norway on the causes of terrorism resulted in a series of essays and two books on this aspect of terrorism.[33] Echoing Wilkinson, Bjørgo sets the stage by describing terrorism causes as "preconditions" or "precipitants." One might conceive of this idea as a salience spectrum of causes, with preconditions and precipitant events marking the endpoints of the spectrum. Toward the precondition end are structural causes like globalization, modernization, or demographics; and facilitator causes like the evolution of weapons or weak state security. The middle ground includes motivational causes, which often include preconditions spun up by leadership or government policies with which the group disagrees. At the far precipitant end of the spectrum are triggering causes, such as Ariel Sharon's visit to Haram al-Sharif that kicked off the second intifada, or the murder of Israeli settlers that spurred violence in Israel in 2014. Other essays in this collection reference and provide excellent summaries of the research on the relationship between poverty and terrorism (very weak); psychological characteristics of terrorists (rational and complex, with a calculus based in group as often as individual perceived goods or slights), vicious cycles that continue terrorist activities; whether it is better to addresses sustaining factors or root causes; and general recommendations on addressing identified causes. Finally, one essay described three motivational profiles for terrorists, that can be identified from observation of actions, but that are often intertwined in a group and even in a single individual. Mercenary, True Believer, and Captive Interest are rough profile types that seem to be supported by most other research, though often that research uses different terminology.

A number of other works provide examples of other approaches to terrorism studies. Michael Kenney attempts to apply the business analysis tools of organizational

32. John Horgan, *The Psychology of Terrorism*.

33. Tore Bjørgo, ed., *Root Causes of Terrorism: Myths, Reality, and Ways Forward* (London; New York: Routledge, 2005); Tore Bjørgo and John Horgan, eds., *Leaving Terrorism behind: Individual and Collective Disengagement*.

learning and competitive adaptation to terrorist and counter-terrorist networks.[34] He discusses knowledge dissemination from a techne/metis perspective that I plan to relate to an explicit/implicit and individual/group knowledge framework that I will be using elsewhere in the paper. Describing decision and accountability flow through sample terrorist organizations as "hierarchical yet diffuse," Kenney, in my opinion, provides a perspective on how Cold War uncertainty strategies might need to be modified to work for terrorist groups. His analysis of information flows, authority structures and decision cycles may also prove useful, though I am likely to temper such possibilities with references to epistemological analysis that indicates the limitations of explicit information transmission in social organizations.[35]

I will also consider a variety of articles on game theory and statistics in counter-terrorism. Unfortunately the methodology and application of the examples I've found result in very little of value beyond general theory. The only idea of real value I've taken from them so far is Gelernter's "Law of Loopholes," which describes how competitive players in a complex systems will always find loopholes around safeguards.[36] This is particularly relevant to terrorists, for whom myriad viable targets magnifies the effect. While far from new, a more game-theoretic formulation of the concept will be useful.

5. Advances in Game Theory, Social Science Tools

In the years since the height of Cold War planning, much research has been done on various aspects of information theory. Classical game theory as outlined by Neumann and Morgenstern was relatively static. It assumed that each player would make decisions based on what would yield them the best outcome given the rules of the game, but failed to account for players making decisions based on their expectations of their opponent's

34. Michael Kenney, *From Pablo to Osama Trafficking and Terrorist Networks, Government Bureaucracies, and Competitive Adaptation* (University Park, Pa.: Pennsylvania State University Press, 2007).

35. Scott D. N. Cook and John Seely Brown, "Bridging Epistemologies: The Generative Dance between Organizational Knowledge and Organizational Knowing," *Organizational Science* 4, no. 2 (August 1999): 381–400.

36. Alyson G. Wilson, Gregory D. Wilson, and David H. Olwell, eds., *Statistical Methods in Counterterrorism: Game Theory, Modeling, Syndromic Surveillance, and Biometric Authentication* (New York: Springer, 2006).

moves. Numerous researchers have attempted to remedy this issue in the intervening years. Steven Brams introduced a more dynamic approach that maintains mathematical rigor while allowing for the complexity of taking into consideration future reactions to one's own decision.[37] Others have disputed this method, but it is still useful for this research.[38]

Bayesian analysis illustrates a different vein of game-theory development. This is a mathematical formulation of the intuitive practice of weighting evidence depending on its source and measuring new data against the sum of existing evidence, and has become common practice in modern science. Glen Schafer outlined in his classic work *A Mathematical Theory of Evidence* (cited in more than 13,000 articles, according to Google Scholar) a more generalized application of Bayesian-type probability assessment, which does not require specific veristic probabilities to arrive at a confidence rating.[39] His "Dempster-Schafer Theory of Evidence" sometimes provides different results than classical probability assessments, and is likely more accurate in uncertain situations.

Such mathematic tools have more recently been put to use in the field of logic. Classical logic is limited by its exclusively bivalent truth functions, meaning it is only fully useful when you have a good understanding of both the issue you are addressing and the specific truth-values of its various components. In the 1960s, the emergence of modal logic added "likely/unlikely" and "possible/not possible" as available descriptors when describing uncertain situations, and a few years later fuzzy logic opened further possibilities by creating sets with fuzzy barriers. In the last decade, Louis Zadeh extended the tools of fuzzy logic into the realm of statistical probability analysis to outline ways in which we can better deal with uncertain situations and create more accurate models, as well as how to more accurately deal with the linguistic "granulations," i.e., fuzzy sets

37. Steven J. Brams, *Theory of Moves* (Cambridge [England] ; New York, NY, USA: Cambridge University Press, 1994).

38. Emily Woerdman grants the validity of Bram's solution, but emphasizes the inherent instability of such solutions. Her examples of its application to prisoner's dilemma type problems provides an excellent reflection of what one generally observes in this type of game. Emily Woerdman, "Rationality and Stability in the Theory of Moves: The Case of the Prisoner's Dilemma," *Rationality and Society* 12, no. 1 (February 2000): 67–86.

39. Glenn Shafer, *A Mathematical Theory of Evidence* (Princeton, N.J.: Princeton University Press, 1976).

such as the everyday descriptors "young," "tall," "most," "usually," etc.[40] By classifying data into these fuzzy sets and then "defuzzifying" the resulting data, information scientists are finding they are able to more accurately model complex realities.

Finally, much work has been done on the limits of people's ability to act rationally. Though individuals generally try to make "rational" decisions (i.e., choices that have been calculated to provide the most benefit or best chance of reaching specific objectives) they are often unable to do so because of imperfect information, social pressures, cognitive biases, lack of intellectual ability, or other reasons.[41] The heureristics that we rely on to process the vast quantities of information we take in sometimes fail us all, but even worse is that we often fail to recognize that such weaknesses might occur in our own mental processes.[42]

40. Lotfi A. Zadeh, "Toward a Generalized Theory of Uncertainty (GTU)—an Outline," *Information Sciences* 172, no. 1 (2005): 1–40; Lotfi A. Zadeh, "Is There a Need for Fuzzy Logic?" *Information Sciences* 178, no. 13 (2008): 2751–79.

41. Bryan D. Jones, "Bounded Rationality," *Annual Review of Political Science* 2 (1999).

42. Sam L. Savage, *The Flaw of Averages Why We Underestimate Risk in the Face of Uncertainty* (Hoboken, N.J.: Wiley, 2009); Nassim Nicholas Taleb, *The Black Swan: The Impact of the Highly Improbable*.

II. COLD WAR PROBLEMS AND APPROACHES

A review of the literature has illustrated the frequent lack of rigor in terrorism studies and contrasted this with the more painstaking approach of many Cold War scholars. To determine whether any of the lessons from previous generations' information-theory approaches to nuclear deterrence may hold relevance to the study of terrorism, one must first review the situation faced by theorists working in the 1950s and 1960s and consider the approaches they used.

A. OLD WAR PROBLEMS AND SOLUTIONS

Shortly after the end of the World War II, the United States faced a complicated new strategic problem. We possessed weapons capable of destroying enemies at will, quickly and efficiently. Unfortunately, our enemies had this same capability, and either side was probably able to launch a surprise attack that could destroy its enemy. However, if such an attack were to fail, the response would doubtless be so devastating as to be existentially threatening. This meant that a military conflict of any kind—or any heated political conflict, for that matter—had the potential to suddenly escalate to mutual annihilation. As summarized in the first book published on U.S. nuclear policy, in 1946: "Thus, far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them. It can have almost no other useful purpose."[43] So began the Cold War.

For the next several decades, the only rational security goal was to prevent war. The question at the forefront of security policy research then became: What doctrine and strategies can we employ to effectively prevent war? More accurately capturing the complexity of the problem, the question was: How can we avert war today while continually building our sphere of influence to ensure our continued economic and military dominance in the future? Emerging game theory and (later) systems theory were among the most widely employed tools by early strategists to address this problem.

43. Frederick S. Dunn et al., *The Absolute Weapon*, ed. Bernard Brodie, 1st ed. (New York: Harcourt Brace, 1946). Interestingly, this perspective was strongly argued by strategists and scientists alike even though the Soviet Union would not have any operative nuclear weapons for another three years.

The first to robustly outline game theory's application to security was Thomas Schelling, whose 1960 book *Strategy of Conflict* was hugely influential at the time and remains relevant enough today to be commonly assigned in security and economics courses. His arguments began with the idea that conflict is not a pathological state that can be avoided, but is rather a natural and inevitable part of human interaction.[44] Assuming this is true, resources should be spent more on *managing* conflict than trying to prevent or avoid it. Schelling's second foundational premise is that all virtually conflicts in the real world are non-zero-sum games. That is, real-world conflict is almost never pure conflict, with no overlap of interests. As such one side's victory (or loss) does not necessarily have bearing on the wins or losses of the other side. One relevant example is that no matter who "wins" in a nuclear war, both sides end up much worse off than had the war never taken place. Schelling argues that there is almost always a set of overlapping interests, and that international conflict is actually a type of bargaining.[45] His conclusion, similar to Brodie before him and many others after, is that the best military strategy in the nuclear age is one that specializes in "skillful non-use of military force."

Unfortunately it is far easier to state an intention to avert war than it is to craft policies that actually do so. It may be the case that "military strategy can no longer be thought of … as the science of military victory" but "the art of coercion, of intimidation and deterrence.[46] But a realist perspective of conflict reveals many situations in which coercion and intimidation seem inadequate to the task. Political scientist Warner Schilling proposed the following thought experiment: Imagine you are locked in a "fortress-like squash court" with someone whom you believe to be evil. The room is divided in two

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44. This echoed Freud's belief that conflict was a necessary part of inter-group relations, with humans always needing an outside force to become the focus of anger and hate. It also appears to be supported by more rigorous work done in recent years.

45. This is reminiscent of Clasewitz's famous definition of war as a "continuation of political commerce … by other means." Although this part of Clausewitz's argument is consistent with Schelling's premise, Schelling goes much further by asserting that any conflict, whether through war or words, can be settled in many different ways, some of which are likely to leave both parties better off or both parties worse off. This would appear to be inconsistent with Clausewitz's instruction (in the same chapter as his definition of war) to fight "absolute war" against the enemy to maximize chances of victory, employing all resources available. Carl von Clausewitz, *On War*, trans. Col. J.J. Graham. New and Revised edition with Introduction and Notes by Col. F.N. Maude, in Three Volumes (London: Kegan Paul, Trench, Trubner & C., 1918). Vol. 1. Chapter: CHAPTER I: WHAT IS WAR?

46. Thomas C. Schelling, *Arms and Influence* (New Haven, CT: Yale University Press, 2008), 34.

with high concrete wall, with one of you on each side with ten "totally good" babies. Each of you also has a hand grenade. If either throws their grenade, the other is likely to have just enough strength left to throw their own and ensure the deaths of all.[47]

This is a good metaphor for Cold War nuclear deterrence. An evil person—or for that matter, any rational person facing a "good" enemy—has every motivation to act first. This is because any reactive response from a "good" person to a first strike could only be motivated by revenge, as the conflict has already been lost, and could only be accomplished at the cost of many innocent lives. Any rational person, knowing that their good opponent is unlikely to kill many innocents out of revenge, knows they have the upper hand—as their opponent is restrained by their moral framework from reacting to an attack—and therefore has a motivation to attack.[48] And because both sides in war tend to view themselves as good and their enemy as evil, both assume that the enemy is at the gates with little reason to refrain from attack. Such natural tendencies are destabilizing, meaning that active stabilization strategies are a necessity to maintain peace.[49]

The question becomes: What methods of preventing unwanted actions by our enemies do we have at our disposal? Obviously this is highly situational, but for most of the Cold War, the key was a strategy of aggressive deterrence. Described by Schelling as "influencing the choices another party will make by influencing his expectations of how we will behave," deterrence is at its root a game of expectations. For such a game to work, a few necessary qualities must be present. First, one must have methods of communicating one's intended response to different actions. These communications might be explicit or implied, public or back-channel, linguistic or symbolic (as through movement of resources). One's enemy must be able and willing to understand such signals, which requires they be at least moderately rational and reasonably intelligent.

47. As described by Roger Hilsman, *From Nuclear Military Strategy to a World without War: A History and a Proposal*, 50.

48. Ibid.

49. The problem of nuclear deterrence stabilization has been an active topic of discussion for over sixty years. For an excellent contemporary examination of the idea, see Elbridge Colby, "Defining Strategic Stability: Reconciling Stability and Deterrence," in *Strategic Stability: Contending Interpretations*, ed. Elbridge Colby and Michael S. Gerson (Strategic Studies Institute, U.S. Army War College, 2013).

Deterrence also requires at least some understanding of what an enemy values, and methods of affecting the valued resources, people, or locations.

In most international (i.e., between nation-states) conflict situations, these elements are all obviously in place. When considering an enemy nation, one can easily list a variety of resources they value: their cities, factors of production, methods of trade, military assets, leaders, and the population at large. As a superpower, we can quite easily destroy or devalue many of those items, and decision-makers of national governments can almost always be assumed to be rational or they would not last long as leaders.[50]

We then find ourselves at the primary difficulty in any strategy of deterrence: How do we communicate threats that are believable, i.e., *credible*? If a threat would cost us little to implement and is fully in line with others' past experiences with us, simply stating it might be enough.[51] However, as threats become more costly to implement—most costly being war that is likely to be horribly destructive to our own interests as well as to those of our enemies—it becomes more difficult to deter unwanted action simply by stating our intentions. This is when more commitment is required. "Binding oneself, in honor or reality"[52] is a good way of doing so. Binding through honor might include treaties with foreign nations, public statements of intent that would be difficult to back out of, or staking one's national pride through a binding of the issue to national dignity. Obviously a commitment bound only by honor is less credible than more rigid commitments. Thus, the most credible threats of all would force one to action regardless of whether doing so is the preferred response. In previous eras this could be accomplished by marrying the children of one's royal family into the ruling families of allies, thus binding oneself to protecting that kingdom's stability in order to protect one's

50. There are occasional exceptions: for example, North Korean leadership acts irrationally at times, but when one considers their methods and apparent objectives, even they appear to be mostly rational. If we were to consider their actions within their own frameworks and with their own objectives in mind, it may be the case that they are in fact entirely rational.

51. An example might be threatening economic sanctions against a dictatorial regime that is actively harming our interests in their region, as we have taken such action many times in the past. Even better, we might threaten sanctions against such products as agricultural commodities that are also produced in The United States. Such an action would not only cost us nothing, it would benefit our own economy. Such a threat would be even more credible as it would provide secondary benefits.

52. Thomas Schelling, *Strategy of Conflict*, 6.

offspring. Today an example might be allocating irrevocable response authority to a general known to be an aggressive hawk. Among the most rigid would be a doomsday machine like that in *Dr. Strangelove* (whose character was based on the theorists cited here), which automatically launches a full-scale nuclear war if a single enemy launch is detected.

There are a number of other actions that can be taken to increase effectiveness of deterrent threats. Developing lesser response options might be assumed reasonable in that they offer more moderated options short of all-out war. However, they also decrease the credibility of any more severe threats, so limiting intermediate response options should increase credibility and better prevent the beginning of smaller wars that are likely to escalate.[53] Offering enemies a face-saving "out" as part of the threat design will also increase the likelihood that they will respond in the desired way, as they are not stuck in a lose-lose situation. Therefore, threats should always include such an out, implicit or explicit, to realize full effectiveness.

A review of the history of nuclear deterrence by the United States provides numerous examples of these techniques put into practice. Roger Hilsman, who served as an adviser to Presidents Kennedy and Johnson and worked on exactly these issues, in practice and under pressure, offers some interesting case studies. The first nuclear-strike plan against the Soviet Union, SIOP-62 (Strategic Integration Operations Plan, 1962) identified 1,060 DGZs (Designated Ground Zeros) that would be attacked by 1,675 nuclear warheads. Nearly 4,000 critical "targets" would be destroyed, many of which included important population centers in Soviet-allied nations such as China that had no missiles. This plan was rapidly discarded, as leaders perceived such a high level of unnecessary casualties as un-American. Kennedy was said to have remarked after being briefed on the plan, "And we call ourselves the human race!"[54] Part of this resistance was pure moral revulsion, but it also reflected his understanding that as the "good guys" such threats by the United States were simply not acceptable, and thus not credible. To address

53. Roger Hilsman, *From Nuclear Military Strategy to a World without War: A History and a Proposal*, 51.

54. Richard, Reeves, *President Kennedy: Profile of Power* (New York: Simon & Schuster, 1994), 230.

this, the following nuclear strategy approach, developed by Robert McNamara, worked to name only military and intelligence locations as targets. Even though "the Soviets, and many in the West, said a counterforce and first-strike strategy were identical"[55] because many of those military and strategic targets were in or near the same cities that were previously targets themselves, such an approach assuaged American consciences and offered to the world a more credible—and therefore more effective—maximum-force threat. Indeed, variations of this same approach underpinned Nixon's Schlessinger Doctrine[56] and Carter's Countervailing Strategy of 1980.[57]

Another lesson can be found in Hilsman's description of the Europeans' strident resistance to tactical nuclear weapons, and to any "no first strike" strategy. Smaller nuclear warheads would do less to deter incursions into Europe and possibly move the worst of the battlefield to their own homelands, so resistance to them made sense within that frame. Instead they preferred massive strikes at Soviet population centers in response to any incursions into Western Europe and resisted any U.S. or NATO weapons deployments that might offer the option of smaller strikes. "The Europeans' greatest fear was what came to be know as 'decoupling,'"[58] which included any separation of conventional and nuclear strategies. Such a separation could lead to Soviet invasions of Europe using only conventional weapons, being resisted by U.S. conventional forces, again moving the battlefield to a European theater. Even worse, an invasion might be ignored by America in order to prevent Soviet nuclear bombardment of the U.S. homeland. European strategy therefore strived to remove all intermediate options by decreeing that any Soviet aggressions should result in a full nuclear strike by NATO.[59]

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55. Roger Hilsman, *From Nuclear Military Strategy to a World without War: A History and a Proposal*, 54

56. Ibid., 87–88.

57. Ibid., 89.

58. Ibid., 84.

59. Although our formal policy was first-strike on any (even conventional) Soviet attacks on NATO countries, McNamara himself later admitted that the U.S. would have been extremely reticent to be the first to launch nuclear weapons against the USSR given a conventional attack on Western Europe. Robert S. McNamara, *Blundering into Disaster: Surviving the First Century of the Nuclear Age*, 1st ed (New York: Pantheon Books, 1986).

In a similar vein, Schelling candidly recounted a less widely understood reason for U.S. troops being stationed in Germany, a move he was assigned to negotiate in 1953 during his work on the Marshall Plan

> When Secretary of State Acheson went up to the Senate to be interrogated on what good seven American divisions would be in Europe, when even with seven divisions, the Soviets could overrun Western Europe, his answer was very simple. He said that what those seven divisions can do is not defend Western Europe, but can guarantee that if they are destroyed or captured the American people will not let the war stop there. These are hostages of fortune, to die or be captured … that was part of making the threat, that was the commitment.[60]

Stationing forces in Europe was, according to Schelling, less about building relationships or providing defense than binding our cause to that of NATO's, putting our skin in the game—literally, in this case—to heighten the credibility of our threats to strike back powerfully at Soviet attacks on Europe.

B. THE WEAKNESS OF SPECIFICITY

Readers familiar with the narrative of nuclear deterrence through the Cold War—or even those with little knowledge of Cold War strategy who reflect on the implications of the strategies outlined above—are likely to see two major issues with using them as foundational components of national security policy.

First, deterrence works by communicating to the enemy what they can expect us to do if they take certain actions. To be effective, threats have to be specific to a certain degree. If the enemy crosses a certain line (e.g., build up troop levels in a region to a certain level) then we will respond in a specific way. Too much specificity, however, simply encourages the enemy to build up exactly to the edge of what is allowable before we respond, then push against our limits of tolerance. This stressing the boundaries of acceptability almost inevitably leads to brinksmanship, and tells the enemy exactly how far they can go with no repercussions. In addition, providing too much detail on how we will respond to specific offenses erodes our ability to respond to smaller incursions without decreasing the credibility of future deterrent threats.

60. Jean-Paul Carvalho, "An Interview with Thomas Schelling," *Oxonomics* 2 (2007): 1–8.

Second, the process of limiting lesser actions means we may be left with only options that are simply too overwhelming to be credible. The costs to us of actually implementing more major threats might be so great that the enemy will doubt that we have sufficient determination to fulfill the threat.[61]

Combined, the acceptable boundary problem and the scale credibility problem lie at the heart of many of the security dilemmas of the modern age, both nuclear and non:

- The Korean War began with a miscalculation by the USSR. Having just supported a Communist takeover of China, Soviet leaders assumed that the U.S.'s principle of containment had an eastern border of the Sea of Japan, and that the Americans wouldn't risk war simply to protect South Korea. President Truman took a firmer stand than the Soviets had predicted, resulting in three years of war.[62]
- Since 1979, the U.S. has promised to protect Taiwan against any threat from mainland China.[63] Thirty years ago, when China was a much smaller presence on the national stage and a mostly closed Communist economic system, a bright line of total defense of Taiwan risked little and was consistent with our Cold War interests. In the intervening years China has largely opened its economy and become one of the top U.S.'s trading partners, and, perhaps more importantly, our top creditor. They also continue to develop their military might to near-superpower status.[64] These factors are eroding the credibility of a firm U.S. stance on support for Taiwan. As the *Bloomberg* editorial staff so starkly frame the issue in 2012: Are we really willing to lose Los Angeles in defense of Taiwan?[65]
- In August 2012, President Barack Obama said in a press conference, "We have been very clear to the Assad regime, but also to other players on the ground, that a red line for us is we start seeing a whole bunch of chemical weapons moving around or being utilized. That would change my calculus."[66] The Assad regime evidently saw those threats as not credible,

61. And our enemies would have been right to be incredulous of such a threat, as McNamara's quote in note 56 demonstrates.

62. Henry Kissinger, *Diplomacy,* 475.

63. Jaushieh Joseph Wu, "The Future of US-Taiwan Relations," *The Diplomat*, May 14, 2014, http://thediplomat.com/2014/05/the-future-of-u-s-taiwan-relations/.

64. John Hemmings, "China and America: A Superpower Showdown in Asia," *The National Interest*, June 14, 2014, http://nationalinterest.org/feature/china-america-superpower-showdown-asia-10661.

65. Editors, "China-Taiwan Tensions Could Loom Over U.S. 'Pivot' to Asia: View," *Bloomberg View*, February 26, 2012, http://www.bloombergview.com/articles/2012–02–27/china-taiwan-tensions-could-loom-over-u-s-pivot-to-asia-view.

66. "Remarks by the President to the White House Press Corps," August 20, 2012, http://www.whitehouse.gov/the-press-office/2012/08/20/remarks-president-white-house-press-corps.

because it subsequently used chemical weapons numerous times.[67] Assad's assessment of the risk of such actions appeared to be correct, as there was no U.S. military response.

- Russia's 2014 takeover of Crimea began with a buildup of troops along the border in areas legally their own. This pushing of boundaries didn't elicit any outside response, and Russia's subsequent invasion and takeover of Crimea, then other parts of Ukraine, is classic piecemeal aggression, as each small step seems too little offense to warrant a real response.[68]

C. THE UTILITY OF AMBIGUITY

One of the most effective tools at our disposal in mitigating the weaknesses deriving from these problems is the introduction of measured ambiguity. This can be accomplished by sending signals of uncertainty, partial information, or disinformation. Perceived ambiguity can be a huge benefit in security strategy, as the enemy can no longer locate the limiting line of their behavior. By threatening when they are close to offending one's established "rules," but never being completely clear on where the line is, one is afforded greater latitude in taking context into account. Sharing or hinting at information about one's lack of capabilities can incite uncertainty around the options one is able and willing to consider. Ensuring that different channels of information (e.g., diplomatic, military intelligence, public speeches) carry different messages can build great uncertainty. Too much ambiguity introduces the risk of decreasing one's credibility, especially when paired with unexpected actions. But when properly scoped and managed, such purposeful apparent randomness can actually enhance credibility in the short and long terms. Maintaining gray areas can illustrate that one is willing to take context into account, but this will only be effective if some credibility exists on which to trade, and if aggressions outside that window are responded to forcefully.

67. "Fact Sheet: Timeline of Syrian Chemical Weapons Activity, 2012–2014," Arms Control Association, accessed November 22, 2014, http://www.armscontrol.org/factsheets/Timeline-of-Syrian-Chemical-Weapons-Activity.

68. Uri Friedman, "Russia's Slow-Motion Invasion of Ukraine: Is Putin Waging a New Form of Warfare, or a Very Old One?," *The Atlantic*, August 29, 2014, http://www.theatlantic.com/international/archive/2014/08/russias-stealthy-slow-motion-invasion-of-ukraine/379312/.

The employment of real randomness in dealing with a limited set of options works in a similar way.[69] If the only response action we have at our disposal is an attack out of proportion to an instigation, we might state a 10 percent chance of our using overwhelming force as a response to a more minor incursion. In the idealized world of pure theory, binding oneself to a random response generator that gave a 10 percent chance of massive reprisal should equal, in any rational individual's mind, a response 10 percent as great as the actual response should we carry it out 100 percent of the time. In reality no one would accept such a random response system (a Wheel of Fortune with a neutron bomb on the "bankrupt slice"?), nor would anyone believe that such a random decision would be similar to a lesser threat. But the utility of such an approach is difficult to deny and may offer a variety of advantages. The following chapter will illustrate that such processes are often inherent in political systems, and by pointing them out to our enemies we can take advantage of these "weaknesses" of the system.

Numerous nuclear strategists have written about the utility of ambiguity, and it has been a part of nuclear strategy in practice almost incessantly for half a century. Though much of the ambiguity of the early years of the nuclear age focused the need for flexibility to deal with "lesser aggressions, such as the 1950 attack on South Korea,"[70] by the mid-1960s military leaders like French general Gallois and McNamara, as well as civilian strategists like Brodie, Kahn and Schelling, were exploring in great detail how deliberately ambiguous policy could have a deterrent effect. Using game theory, Schelling attempted (with little success) to show how one might quantify precisely what value of randomness offers the best deterrent effect.[71] Kahn took a less formal approach, instead relying entirely on reasoning and avoiding the formalization of statements and payoff matrices, but came to many of the same conclusions.[72] Yet in a more practical frame, in 1961 Gallois argued that "a widely publicized but vague determination is more

69. Some may in fact consider it a category of ambiguity of action; I'm considering them separately here because some upcoming examples are best illustrated when considering them as distinct.

70. Roger Hilsman, *From Nuclear Military Strategy to a World without War: A History and a Proposal*, 57.

71. Thomas Schelling, *Strategy of Conflict*, 175–186.

72. Lawrence Freedman, *The Evolution of Nuclear Strategy*, 158, 172.

valuable, that specific promises that cannot always be kept, and that would furnish the other side valuable indications as to the policy the latter could pursue with impunity."[73] In his history of British nuclear policy, John Baylis summarized a variety of specific areas of policy ambiguity, including deterrence through punishment versus deterrence through denial;[74] triggers for escalation; and whether one is trying to achieve minimal deterrence capability or nuclear superiority.[75]

Baylis also argues that such attempts to sow uncertainty, undertaken by both sides of the Cold War nuclear stalemate, resulted in an incredibly foggy picture of how the nuclear world worked. These strategies bred great uncertainty about how likely nuclear war might be, how likely conventional war was to escalate, and how long such a war might last.[76] In effect, nuclear strategy became all "about authoring cryptic texts, interpreting deliberately ambiguous messages, and orchestrating and interpreting symbolic performances—displays in which appearance is everything."[77] In short, uncertainty management became the order of the day, both an objective and a skill set.

Writings about true chance (as opposed to uncertainty) were less common, and less well received. Schelling was again among the first, though as usual his recommendations were highly theoretical and took the form of metaphors. As an extension to his line of reasoning about purposeful apparent randomization of one's actions, he proposed the following thought experiment.[78] Imagine yourself chained to another person, both of you standing on the edge of a cliff. The first one to give up gets

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73. Pierre Marie Gallois, *The Balance of Terror: Strategy for the Nuclear Age* (Houghton Mifflin, 1961).

74. That is, does a nation plan to launch a counterforce strike that will destroy an enemy's ability to operate? Or is the plan to refrain until the enemy has destroyed parts of one's own national interest, then respond with a strike on the offending nation's cities and industry? John Baylis, *Ambiguity and Deterrence: British Nuclear Strategy, 1945–1964*, Nuclear History Program 4 (Oxford ; New York: Clarendon Press, 1995).

75. Ibid. These are themes throughout the book, but they are well summarized in the conclusion, particularly pages 360–378.

76. Ibid., 5.

77. Ron Hirschbein, *Massing the Tropes: The Metaphorical Construction of American Nuclear Strategy* (Westport, Conn: Praeger Security International, 2005).

78. Really just a strategy to increase credibility by binding oneself to randomness to show you are really serious to about relying on chance.

nothing, but whoever holds out longest wins a significant sum of money. How might you increase your chances of winning? His proposal was to start dancing closer and closer to the edge of the cliff, acting like a madman.[79] This is similar to the classic game-theoretic example of the game of chicken in which the payoff matrix will always encourage a rational opponent to swerve.[80] When facing real (i.e., less than perfectly rational) opponents, one can increase chances of victory by getting drunk and then, while hurtling toward one's opponent, remove the steering wheel and throw it out the window.[81] The critical difference that distinguishes the dancing-madman example, however, is that in Schelling's extreme game of chicken, your opponent has been put entirely in control and given a stark and certain choice: swerve or you will lose. In contrast, dancing on the edge of the cliff puts power in the hands of chance by introducing a constant threat of destruction to both. This is better described as: We are both on the verge of death with χ percent of falling at any time, and this will continue until you give in. Schelling would later make the distinction more clear in separately defining "impellance" and "compellance,"[82] either of which may have a random component.

Application of these theories to reality "led to conclusions that seemed quite bizarre to the military mind."[83] Stability, according to this approach, could only be achieved by limiting our own options in order to decrease the enemy's incentives to make the choice it might otherwise prefer. In one Cold War example, to decrease the Soviets' incentive to attack the West, NATO nations should maintain weapons stockpiles capable of surviving a massive first strike and delivering a response with overwhelming force (so

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79. From classroom lectures described by former students. Michael Kinsley, "A Nobel Laureate Who's Got Game," *Washington Post*, October 12, 2005, http://www.washingtonpost.com/wp-dyn/content/article/2005/10/11/AR2005101101336 html.

80. Thomas Schelling, *The Strategy of Conflict*.

The payoff matrix for a game of chicken would generally consist of a small positive value for a win or loss, but a large loss for a crash. There are four quadrants based on two axes, each a driver choosing whether to swerve or not. If both swerve the game is a tie. If one swerves the other wins, but not as much as both would lose in a crash if both stay the course. This indicates that staying the course is rational only if you have very good reason to believe your opponent will swerve.

81. Lawrence Freedman, *The Evolution of Nuclear Strategy*, 176–177.

82. Thomas Schelling, *Arms and Influence*.

83. Lawrence Freedman, *The Evolution of Nuclear Strategy*, 183.

far so good for the generals), but should not develop weapons accurate enough to disable the USSR's military capabilities. "A weapon that can hurt only people, and cannot possibly damage the other side's striking force, is profoundly defensive; it provides the possessor no incentive to strike first."[84] Counter-intuitively, ensuring our capabilities are less than those of our enemies, in certain ways, can lead to safety through stability.

Forty years later, Hilsman argued that exactly this logic was part of the motivation behind many arms-control efforts for the remainder of the Cold War. Weapons-reduction treaties often tried to increase second-strike options at the expense of first-strike capabilities in an attempt to increase stability. The START-II treaty which drastically reduced the number of Multiple Independently-targeted Reentry Vehicles (MIRVs) was indicative of this approach, as a single MIRV increased the number of targets that could be struck in an initial attack while decreasing the number of targets an enemy needed to hit to totally disable one's capabilities.[85] As counterintuitive as it may seem at first glance, we were achieving better security by reducing our capabilities and increasing the uncertainty that we would be able to incapacitate our enemies.

D. NUCLEAR STRATEGY LESSONS FOR TERRORISM

Modern work on terrorism has a few parallels with nuclear deterrence strategies. Most fundamentally, as in the Cold War, we are facing enemies that we could destroy utterly on the battlefield, but a pyrrhic victory would be a possible outcome and the methods by which we could "defeat" our enemies would clash intensely with America's view of itself. Just as Herman Kahn was vilified for decades as a bloodthirsty advocate of murder for his support of first-strike nuclear options, any heavy-handed and high-casualty response to terrorists results in cries of immoral overreaction. Israel wrestles with this ethical dilemma/public relations problem during every Intifada. An out-of-proportion response erodes a nation's self-identity as the "good guys" from within, and diminishes

84. Thomas Schelling, *The Strategy of Conflict*, 233.

85. Negotiated by Clinton and Yeltsin, the START-II (Strategic Arms Reduction Talks, second round) agreement was never officially adopted but it still led to the retirement of The United States' newest, largest, and most advanced MIRV, the MX missiles which could each accurately strike 10 separate targets with 300 kt warheads, as well as many of Russia's MIRVs. Roger Hilsman, *From Nuclear Military Strategy to a World without War: A History and a Proposal*, 111.

the moral authority required to operate internationally. It causes enemies to multiply, and the trust that is necessary to form working relationships with allies is reduced.

Refraining from full use of force is, however, different in fundamental ways in these two different types of threats. Counterterrorism policy can only be called "deterrence" using the broadest of definitions.[86] Classic deterrence impels enemies to behave in desired ways by threatening something they value with destruction, capture, etc., even though what is threatened is often not directly related to the action one is trying to discourage (or encourage, in some cases).[87] Real deterrence includes implicit promises to refrain from specific types of attacks as long as the enemy behaves acceptably. In contrast, counter-terrorist operatives generally do not promise, implicitly or otherwise, to refrain from action until terrorists have carried out an attack. Counterterrorist strategy instead focuses on prevention of all attacks, as much as is possible.[88] Attacks on terrorists and their bases are designed not to *deter* (convincing them to act in a certain way for fear of future attack) but to decrease their capabilities, thereby preventing future attacks.

Despite these key differences, the question remains: if we refrain from use of force in some instances, and use it in other instances, how do we develop doctrine or policy on when force should be employed? And from either our current preventative approach or a theoretical deterrence approach, would it be beneficial to have a publicly declared, clear policy on when we will and will not choose to use different levels of force?

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86. This is not to say that some do not view counterterrorism policies as "deterrent." Major Douglas Tippet summarized such a viewpoint in a 2009 master's thesis. Douglas Tippet. "Deterring Terrorism: A Framework for Making Retaliatory Threats Credible." Masters Thesis, Naval Postgraduate School, 2009; Boaz Ganor, as mentioned earlier, argues that suicide bombers can be deterred if they "result in a response so severe that their loss would exceed any befit they hope to gain." Boaz Ganor, *The Counter-Terrorism Puzzle: A Guide for Decision Makers*, 79.

87. Schelling's distinction between impelling an enemy and compelling an enemy is again relevant here. To impel is to threaten our own response if the enemy takes a certain action. Compellence, on the other hand, is starting a painful action (e.g., sanctions or occupation) that will stop when the enemy makes a specific decision. I use the terms in the same way here.

88. A possible counterexample of this is our more classical-style deterrence of "rogue" nations from supporting terrorism. The U.S. has often threatened unfriendly nations with retribution if they are found to support terrorists looking to attack the West. But this is not deterrence of terrorism directly in that the terrorists are not being deterred from their actions, rather they are being deprived of resources by deterring a national government. As such, this type of deterrence is really a method of prevention in that it is not trying to affect the intentions, but rather the capabilities of the enemy in question (i.e., terrorists).

This question may be even more complicated than it seems. To arrive at even a rough answer, we must examine what clarity of policy entails, which is itself difficult. Then we must investigate the implications of working to increase clarity—or alternatively, striving to increase ambiguity—under different types of circumstances, referencing as necessary the literature from terrorism studies and from nuclear strategy. Finally, ethical and philosophical implications of an open society intentionally decreasing openness must be considered and weighed against possible gains in security. These three steps will comprise the remainder of this thesis.

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III. DEFINING UNCERTAINTY

Having shown that using ambiguity and uncertainty showed theoretical promise and real results during the Cold War, the next step is to determine how these ideas might be applied in the realm of counterterrorism theory. To do so, the terms in use must be more clearly defined and explained.

A. CLASSES OF UNCERTAINTY

Clarity of understanding may seem, at first thought, fairly easy to describe. It includes an understanding of both the concept in question and the context within which it is found, as well as their relationship with that context. It must be noted that good understanding is never perfect, in that there will always remain some uncertainty if only because we are far from omniscient beings and the world within which we operate is a complex place. Additionally, any change within the system is likely to, at least temporarily, diminish one's ability to understand it, and uncertainty will increase. But in many familiar situations we can claim to have a good understanding, and that's usually enough to meet our decision-making needs. A mechanic might have excellent understanding of how an engine works, what problems it is likely to experience in different types of situations, and a knowledge of common failures to watch out for. Similarly a commander might know all of the individuals serving under him and, by knowing everyone's strengths and weaknesses and by referring back to past leadership experience, have a good understanding of his unit's capabilities. However, any changes will at least temporarily diminish understanding.

At the other end of the spectrum, someone with no understanding of military operations dropped into the middle of an active battlefield will perceive only chaos. He would have no understanding of the problem space, and little understanding of the objectives, strategies or tactics employed.

Different models of understanding—the flip side of the same coin as uncertainty—have been proposed through the years, but a few are of particular interest in their relevancy to this topic. Albert Wohlstetter and the RAND Corporation popularized

"systems theory" in the 1950s as an approach to strategy, and it came to be applied to a huge variety of problems (technical, financial, political, etc.). At its heart was "the capacity of viewing problems as a whole, rather than in fragmented components, and to master complexity."[89] Complex systems analysis has continued to grow this concept ever since, and is still applied to a huge variety of problems. Where systems theory met knowledge management, David Snowden described a "social ecology of knowledge" as a stop on the way to creating his now-famous Cynefin sense-making framework.[90]

> Basically the model contrasts certainty of decision making and our level of certainty in our understanding of the situation. If we are confident in both then we are dealing with the known knowns. If we know [understand] the situation but we are not sure of the consequences of our decisions then we are dealing with the known unknowns. If we are pretty certain our decisions will do no harm (an early expression of safe-fail experiments) and will help us understand what is possible then we are dealing with the unknown knowns. Then of course we have the really interesting area, both for threat and opportunity, where, when it comes down to it we have no idea what is going on or what we should do.[91]

Snowden dubbed this final category "unknown unknowns," a term that Defense Secretary Donald Rumsfeld would go on to infamously, though accurately, use in discussing the dangers of Iraq.[92]

In the discussions of uncertainty to follow, it is important to note that discussion will center largely on Snowden's known unknowns and unknown knowns. Known knowns—situations in which we understand the context and what is likely to be the result of our actions—may be relevant when talking about disinformation, but only when part of a broader campaign of inconsistent information to confuse the enemy rather than solely to mislead. Pure disinformation campaigns in which we suspect we know how the enemy will respond are not attempting to create uncertainty, but certainty about untruths.

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89. To a modern eye, the idea of "mastering complexity" seems a bit naïve. Freedman, *The Evolution of Nuclear Strategy*, 168–170.

90. David Snowden, "The Social Ecology of Knowledge Management," in *Knowledge Horizons: The Present and the Promise of Knowledge Management*, ed. Charles Despres and Daniele Chauvel (Boston: Butterworth-Heinemann, 2000), 237–66.

91. David Snowden, "The Origins of Cynefin," *Cognitive Edge*, 2010, www.cognitive-edge.com.

92. Ibid.

Unknown unknowns are irrelevant to the discussion for the opposite reason: if we have no idea what the situation is, or the effect our decisions might make, there is no certainty whatsoever. As "uncertainty" requires some understanding, i.e., a middle ground between excellent understanding and complete confusion, a situation full of unknown unknowns provides no place to stand. Trying to craft recommendations for such a chaotic realm would be a different type of task entirely.

Instead, this paper's focus is at the edge of knowledge, in which we have a good (if always imperfect) understanding of the problem space but are unsure of the implications of our decisions (known unknowns); or situations when we have a pretty good idea of what the outcomes of our decisions would be (in a general sense) but do not have much understanding of the system within which we are operating. These are the types of situations in which an understanding and leveraging of our lack of understanding might provide some benefit. Or, in other cases, we may gain advantage by shifting circumstances to increase uncertainty either of the problem space or our own actions.

B. INHERENT VS. INTRODUCED UNCERTAINTIES

To begin a more thorough analysis, we must first recognize that some uncertainties are inherent and cannot be avoided, whereas others have been introduced by one side or the other. Inherent uncertainties are most often the result of the complexity of the world in which we operate. Physical complex systems like the vagaries of the weather must be dealt with every day, and their effects cascade through our lives and through our operations. In a simple example, the accuracy of any single missile will be dependent on temperature and wind as well as its technology. For a weapon that does not have "smart" systems capable of correcting for the weather, accuracy will be quite poor unless there is virtually no wind, and even then thrust will be uneven and unpredictable enough that rudimentary guidance systems are unable to provide much help. Accuracy can be increased (i.e., uncertainty about its expected effectiveness decreased) by adding smart-adaptive guidance technology that monitors changes as they happen and makes corrections.

Such inherent physical-system uncertainties are commonplace, and can be much more complicated. Operations researchers have been working for sixty years to analyze efficiencies of all types of weapons and tactics, often focusing on quantifying the likely success rates of different types of strategies.[93] Given a specific setup of anti-aircraft batteries, how many bombers are needed to obtain, for example, a 90 percent chance of success in destroying a specific facility? To answer such a question one must analyze the likely effectiveness of the explosives being used, the accuracy of the weapons, the targeting abilities of the crews, the likelihood that a certain number of aircraft will survive the mission (the percentage of which will differ depending on how many are sent), the effects of night versus day, the effects of different weather patterns, etc. These are all examples of inherent uncertainties, often interacting with and magnifying one another, and most are based on physical system complexities.

Another type of uncertainty is that which is inherent in the complexity of the human systems we build. Far less research has been done on this, but there are a variety of theories that have tried to explain the roots of such uncertainties. Most focus on the fact that human systems are made up of individuals with competing interests, which results in dynamic systems of sufficient complexity that their actions cannot be accurately predicted.[94] Baylis identifies three sources of uncertainty in political systems. The Bureaucratic Politics Approach highlights the complexities and infighting inherent in large political systems. The Belief Systems Approach focuses on the "belief systems" of the individuals and groups that make up the system, and the Strategic Culture Approach is similar to Belief Systems but grants more weight to the cultural touchstones and group norms that guide our behavior more subtly.[95]

A second class of uncertainties pertains to those that are introduced to situations purposefully by one side or the other, as opposed to being inherent within the system. As a simple example, consider a boxer's feint that briefly confuses his opponent. This is an

93. Hugh J. Miser, "Craft in Operations Research." *Operations Research* 40, no. 4 (July 1, 1992): 633–39. doi:10.2307/170996.

94. John Baylis, *Ambiguity and Deterrence*, 8.

95. Ibid. Most of the book is organized around these concepts, and how they are perceived to have determined British military strategy.

analogue to the movement of military forces in the field, often designed to be difficult to understand from the enemy's perspective. At a tactical level, such misdirection is critical to any kind of success in conflict, as it is almost always unwise to act entirely predictably. At higher strategic levels, however, introducing ambiguity about one's intent or capabilities is just as critical. The secrecy in which strategic military plans are held is matched in energy by the analysis of what picture should be presented to the enemy. If we have a force advantage, is it better to broadcast or obfuscate that fact? If we have a new weapons technology, should we share details about how it works to prove its viability and provide deterrent influence, or hold it in reserve for use as a surprise advantage? Might we even degrade our own capabilities, as recommended by some theorists, to increase the uncertainty about whether we are a true threat to an enemy in an effort to increase stability?

C. FACT VS. INTENT

The distinction between inherent physical system and human system ambiguities discussed above hints at, but does not correlate with, another distinction that is important to this investigation: ambiguity of fact versus ambiguity of intent. Facts can be true or false, but they do have clear truth values that exist outside one's perception even if it may be impossible to know them for sure. An example of factual ambiguity is uncertainty over how many troops the enemy has, and in what locations. Intent, on the other hand, has no external truth value in this way in that it is merely a construct within my or my enemy's mind.[96] As such it is fleeting, changeable, and exceedingly varied. Even I may not be certain of my own intent at times; my enemy must always be working to guess at my intent from 1) observable fact, which might through disinformation be made uncertain; and 2) my statements of intent, which may or may not reflect my true intent and will be weighed based on how credible my statement appears.

96. This is not necessarily true when the "intent" in question is that of a group, as "intent" when speaking in human system terms might often be said have an external value constantly negotiated by the group. This will be addressed in more detail below in discussing Baylis and Rosenberg, but for the purpose of this section and to properly outline the dynamics of uncertainty as modeled here, intent will be assumed to have no external truth value.

Explicit separation of fact and intent is merely a broader generalization of the capability/will dichotomy that has long been recognized as foundational in political and military affairs. Clausewitz maintained that the purpose of war is to break an enemy's will, which may be done with or without destroying his ability to fight.[97] More recently, Robert Pape has written extensively on "coercion," describing three different methods of breaking an enemy's will by destroying different sets of interests.[98] Even the Department of Defense Joint Operating Plan JP 5–0 is careful to discuss how certain types of attacks may increase uncertainty about facts on the ground in the mind of enemy leaders. This uncertainty may lead to more rapid collapse or, in different circumstances, might result in a slower surrender as the enemy is unaware of how badly he is losing.[99]

Because understanding of intent and understanding of the facts of a given context both derive from the same data points, there is some directional overlap of understanding (and thereby uncertainty) of fact and intent. Such understanding flows only in one direction, however, from perceived fact to assumed intent. The reason for this: When working to understand an enemy's intent, one must assume some level of rationality, else any predictions of what the enemy is likely to do would be impossible. Given the assumption of rationality, intent can be assumed to be bounded by what is possible given the specifics of the situation, and directed by what an enemy knows and is likely to believe about his best options. Therefore, understanding of an enemy's intent is merely a derivation of known facts, and thus to manipulate an enemy's understanding of facts is to shift their understanding of both facts and intent.

97., Carl von Clausewitz. *On War*.

98. Robert Anthony Pape, *Bombing to Win: Air Power and Coercion in War*, Cornell Studies in Security Affairs. Ithaca, N.Y: Cornell University Press, 1996.

99. Joint Operational Planning, "Joint Publication (JP) 5–0." Department of Defense, August 2011. Specific examples of this problem were outlined in a recent article in Military Review, which describes how poor situational awareness by the Iraqi military, caused by US destruction of Iraqi operational centers of gravity, delayed Iraqi surrender. Colonel William G. Pierce, and Colonel Robert C. Coon. "Understanding the Link Between Center of Gravity and Mission Accomplishment." *Military Review*, 76–84. It is worth noting that, although there is a section of JP 5–0 titled "Creating Understanding and Reducing Uncertainty" there is no mention made of managing, leveraging or increasing uncertainty. Page I-5.

Intent on the other hand, not being observable, cannot be used to help determine facts except in a general, strategic-intelligence manner. For example, "based on what the enemy is known to have done in the past, what are his current likely objectives?" This is not knowledge per se so much as a weighting mechanism, however. It also assumes past intent from observed facts, thus bringing us back to the original directionality of intent derived from facts.

D. CLARIFICATION OF TERMS

Now that the "uncertainty" and "ambiguity" have been analyzed in a bit more detail we are ready to establish more specific definitions of the terms as they are used in this thesis. There is much overlap in meaning between the two, and to this point they may appear to have been used interchangeably. Each was chosen specifically to best fit its context; however, based on this distinction: uncertainty is a perception of ambiguity. As such, uncertainty cannot exist without human interpretation of perceptions; conversely, using these definitions uncertainty can exist entirely independent from any real ambiguity if one has an imperfect understanding of reality.

This distinction is important in order to differentiate between actual randomness[100] and lack of understanding, both or either of which can be the result of actions we might take to increase uncertainty. These terms loosely correlate with the classifications above. *Ambiguity*, for example, might refer to the factual likelihood that a missile will hit its target. This bit of randomness exists before and outside of human perception of that ambiguity. *Uncertainty* is the term used when discussing the lack of perfect understanding about where it is going to hit. Sometimes this will also be referred to as *perceived ambiguity*, because given these definitions uncertainty is almost perfectly synonymous with perceived ambiguity.

This becomes more complicated is when discussing introduced ambiguities. When purposefully introducing systemic, factual ambiguities—for example, by degrading our own nuclear missile targeting capabilities as recommended by Schelling and Kahn—

100. More accurately, this "randomness" is actually sufficient systemic complexity that the subject in question cannot be understood. This is perceived as randomness, and usually described as such.

uncertainty (i.e., lack of understanding) about reality will be rooted in actual ambiguities.[101] On the other hand, when we use disinformation as a tool to obfuscate facts, the lack of clarity we create is more accurately termed uncertainty. This is because the lack of understanding we are introducing is more perception than reality, and furthermore likely to exist only on the part of the enemy.

Similarly, most of the time when we are talking about ambiguous intent we will use the term "uncertainty." There will be cases, however, in which we are discussing situations in which one's intent is uncertain even to oneself. This happens when intent is confused as a result of complexity of a system within which we are operating, either physical or political. For example, I may be unsure of whether or not I will launch a specific attack because I'm uncertain about an incoming weather system that might cause problems with our strategy, or because I am waiting on word from high up in the command about whether to more forward with the attack. This bleeding of factual ambiguities into ambiguities of intent will also affect our thinking and our terminology, and we will be more likely to use "ambiguity" rather than "uncertainty" to reflect the roots of the uncertainty in system complexity rather than in individual perception.

Figure 1 illustrates this differentiation. In general, when considering inherent ambiguities of fact they will be referred to as "ambiguities," as will be introduced ambiguities of fact that result from purposefully increased physical system ambiguities. This is represented by the area above the dotted-line diagonal across the diagram. The area below the dotted line encompasses the situations in which the term "uncertainty" is more appropriate, as perception is in those cases more germane than reality. This is true regardless of whether the ambiguities exist in reality or merely in one's perception.

101. This is because such an introduced ambiguity is actually a purposeful increase of the inherent ambiguities of fact.

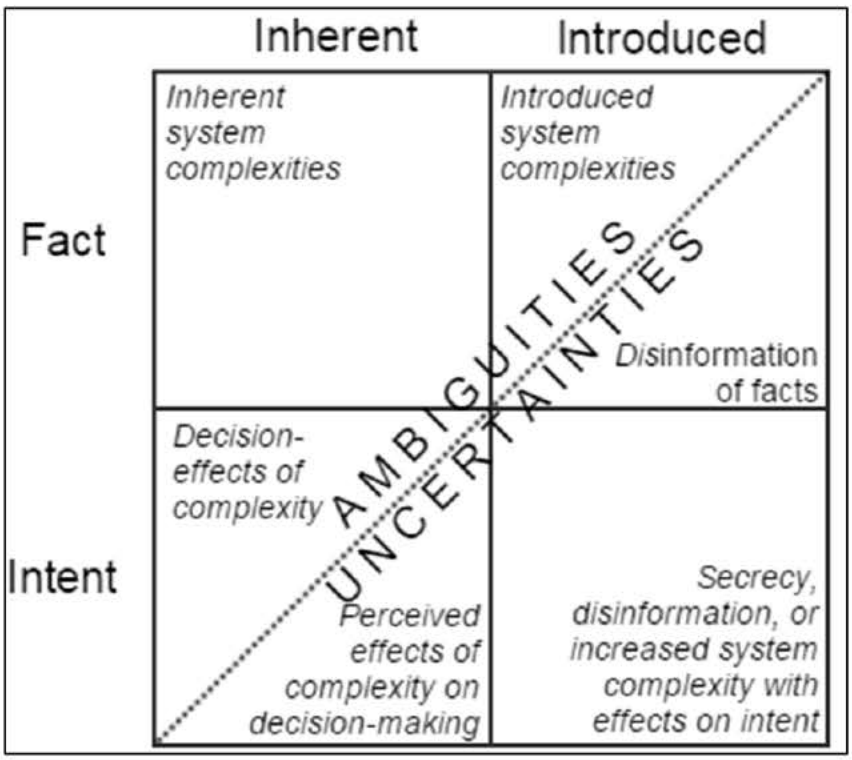

Figure 1. Conceptual map of uncertainty and ambiguity

One final note on the term "uncertainty": as touched on early in this chapter, it refers to a situation in which one has some understanding but insufficient information to reach a reasonably confident conclusion. As such it can be thought of as the middle ground between other options. Does the enemy plan to attack or not? If we convince him we do not plan to attack when we actually are, we are not increasing uncertainty but rather increasing certainty of an untruth. This can certainly have advantages as well, but is outside the scope of this thesis and so will only be discussed in passing where relevant. Instead this work will focus on taking advantage of situations in which we make our enemy unsure of something as a strategic play, or when making everyone more uncertain —ourselves included—might be helpful.

Having established a more thorough theoretical understanding of what is meant by "uncertainty" and "ambiguity," the next section will progress to an analysis of how the various classes of uncertainty have been beneficial in practice in the past and how they may be likely to provide future advantages when addressing the threat of terrorism.

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IV. FOUR CLASSES OF UNCERTAINTY

Ambiguity and uncertainty are abstract concepts, difficult to understand without illustrative examples. The preceding pages defined and categorized these concepts into four different types based on two separate axes: inherent versus introduced, and uncertainty of fact versus uncertainty of intent. A distinction was also made between uncertainty and ambiguity: namely that ambiguity is centered outside any individual's observation, whereas uncertainty resides in an observer's perception. This chapter will attempt to bring these categorizations down to earth, addressing each in turn, describing its characteristics and presenting examples of past use and opportunities in which each might be helpful again.

A. INHERENT FACTUAL AMBIGUITIES: RANDOMNESS AND LEARNING

The world is an incredibly complex place, and every day we have to deal with inherent uncertainties because of the apparent randomness that comes with that complexity. Weather patterns, the behavior of political and economic systems, the likelihood that a certain number of bombers will make it through the enemy's defenses, the chances of getting selected for a more thorough pat-down by airport security, the likelihood that a bomb of a certain size will take down a building; all of these are examples of an *inherent uncertainty of fact*, which might also be described as *perceived inherent factual ambiguity*. We generally measure such uncertainties as percent-chance, for example "an 80 percent chance that the target will be at least 90 percent destroyed," or "a 95 percent chance that a knife of at least two inches will be caught by this baggage scanner." We tend to think of them in terms of how they might be minimized.

Over time, as we gain knowledge and technology, these types of uncertainties are often reduced. This happens through two different mechanisms. First, new technology often corrects for incurable complexities. For example, advanced missile guidance systems adjust for wind or uneven thrust in real time. In these cases we are not removing the source of uncertainty—we still cannot understand and predict wind patterns—but new

tools allow us to mitigate, correct for or avoid those system uncertainties. The second mechanism goes further. Researchers sometimes come to understand the complexities of a system well enough that they become able to make accurate predictions, thus reducing or even removing the uncertainty. This is a common solution for less complex systems. Similarly, especially in complex social systems, improved knowledge might allow us to craft alternate improved systems that the uncertainty simply evaporates.

Working to reduce uncertainty about the world is a basic part of being human. It is a result of learning, applying and sharing of knowledge, identified by economists as the main component of productivity growth and responsible over time for raising standards of living from subsistence to what we know today.[102] With only brief consideration, better understanding all the details of how the world works would seem to have no drawbacks. However, I would argue that in certain situations, specific types of lesser understanding can be a security advantage.

To start, there is at least one obvious situation in which lesser understanding can be advantageous: knowledge possessed by one's enemy. Increasing an enemy's uncertainty of facts will very often work to one's advantage. This is sometimes the case even if one's own understanding suffers as well. Such disinformation campaigns are a standard part of the intelligence game, but by themselves are not the prime focus of this thesis.

More interesting to this project is whether there are situations in which existing, inherent ambiguities that limit our *own* understanding of facts can be leveraged to our advantage. Inherent factual ambiguities as we define them may include any complex system effects that are beyond our full understanding. Weather patterns, as discussed above, are one good example. Another would be shifts in public opinion, or changes in the political system that result either from the passage of time or changes in national

102. The Congressional Budget Office estimates that more than half of productivity growth is due to increases in nowledge: Robert Shackleton, "Total Factor Productivity Growth in Historical Perspective" (Congressional Budget Office, March 2013), https://www.cbo.gov/sites/default/files/44002_TFP_Growth_03–18–2013.pdf; for a more detailed analysis of this process, see James D Adams, "Fundamental Stocks of Knowledge and Productivity Growth," *Journal of Political Economy*, 1990, 673–702.

priorities. Another, relevant to the topic at hand, is trying to predict the growth, evolution or emergence of terrorist groups. Any time we work at the boundaries of our predictive capabilities, inherent factual ambiguity comes into play.

To consider how uncertainty from such ambiguity might confer an advantage, we can look back to Schelling's *Strategy of Conflict*. He wrote at length on how binding oneself in fact is one of the best ways to communicate credibility to an enemy. Weaknesses—including the lack of perfect understanding—can sometimes be put to use in just such a way. Schelling argues that almost every conflict is really a bargaining situation, and bargaining is solved when one side decides that the other would not offer a better solution than the existing option. Therefore, if I have the power to create a variety of options, my opponent will have much greater expectations of the range of options available to him for a deal. One example used by Schelling involves two cars entering an intersection at the same time. Neither wishes a collision, but if Driver A is bound by circumstance to continue moving forward, Driver B will be influenced to grant right of way to A even if he does not wish to. Other examples might be Driver A pulling a heavy trailer, traveling downhill on an icy road, or even not being able to see Driver B.[103] Any of these would be a hindrance to the Driver A in general terms, making it much more questionable as to whether he would be able to avoid a collision. In the question of who has the right of way, however, her more limited options would offer a definite advantage as long as Driver B understands the situation. A clear decision has now been given to Driver B: cause an accident in which we both lose, or grant the right of way to Driver A.

This concept offers lessons for security policy-makers. Numerous Cold War strategists wrote the destabilizing effects of better weapons; an overestimation of U.S. capabilities by the USSR would result in the Soviets perceiving no alternative to a surprise-first strike against us. A comparison can also be made with terrorists who have declared themselves enemies of the U.S. in contemporary times. An overestimation of our power on their part leads to a belief that the U.S. military never makes mistakes and

103. Thomas Schelling, *Strategy of Conflict*, Chapter 2. This example is not exactly that used by Schelling—he wrote of two dynamite trucks meeting on a narrow mountain road—but uses the same theoretical arguments.

that allied nations always act according to our will. Thus, targeting failures are assumed to be purposeful attacks on civilian populations, and extreme actions taken by U.S.-supported states are assumed to have been done at our command.

Put into practice, taking advantage of existing inherent factual ambiguities might mean working to convince terrorists that our capabilities are not as extensive as they might believe. This may take the form of highlighting situations in which we also suffered from our failures, especially if those who are clearly our enemies gained from those mistakes. We might point out past examples of our inability to effect restraint on allied nations or client states or, when possible, demonstrate our own lack of abilities in achieving our objectives in circumstances similar to those that terrorists find particularly objectionable.

As with Kahn's recommendations, highlighting our weaknesses might seem bizarre to some, but in some situations doing so may be advantageous.

B. INTRODUCED FACTUAL AMBIGUITIES: INTELLIGENCE, DISINFORMATION, AND HAMPERING ONESELF

The heart of intelligence is gathering and analyzing facts about the enemy to determine facts about his situation, which in turn should yield clues as to his intent. An enemy generally strives to hide his capabilities and intent from us by secrecy and public exaggeration, or minimization, of the facts. The process of intelligence gathering strives to distill truth out of a mass of diverse and confusing facts. This reduction of uncertainty by analysis of gathered information has been thoroughly examined in the intelligence

literature.[104] More interesting and less well researched is the question of when it is to our advantage to broadcast truths about ourselves, and when it makes more sense to publicly (or semi-publicly) lie about our capabilities, organization, policies or technologies.[105]

At first glance it appears beneficial to tell the truth about our strengths, to demonstrate how difficult it will be to attack us and thus deter such attacks, and lie about our weaknesses to keep from revealing where we might be most easily attacked. But the truth is far more complicated. At times we might lie about our strengths as well, as every strength can become a weakness if it is targeted effectively. A good example is the lengths that intelligence services go to obscure the sources of their intelligence. Sometimes one might not use intelligence if doing so could reveal the source.[106]

However it might be used, a strategy of disinformation will only be introducing uncertainty on the side of the enemy. To fully take advantage of the strategy as discussed here, one would need to introduce uncertainty to the situation as a whole, including on one's own side. Introducing factual ambiguities can work in the same way as taking advantage of inherent ambiguities as discussed in the section above. An example we've already seen is the decommissioning of our MX missile fleet. This hampering of our own

104. As summarized by the Richard Betts: "Analytic certainty is precluded by ambiguity of evidence, ambivalence of judgment and atrophy of institutional reforms designed to avert failures," but intelligence practitioners themselves do an excellent job reducing that uncertainty. "In most cases of mistakes in predicting attacks or in assessing operations, the inadequacy of critical data or their submergence in a viscous bureaucracy were at best the proximate causes of failure. The ultimate causes of error in most cases have been wishful thinking, cavalier disregard of professional analysts, and, above all, the premises and preconceptions of the policy makers." Richard K. Betts, "Analysis, War, and Decision: Why Intelligence Failures Are Inevitable," *World Politics* 31, no. 1 (October 1978): 61–89. This is consistent with other writings as well, for example Erik J. Dahl, *Intelligence and Surprise Attack: Failure and Success from Pearl Harbor to 9/11 and Beyond* (Washington, DC: Georgetown University Press, 2013). Some have gone so far as to quantify the uncertainty reductions of given intelligence products, e.g., Donald Barr and E. Todd Sherrill, "Measuring Information Gain in Tactical Operations," *Technical Report of the Operations Research Center* (U.S. Military Academy, West Point, July 1996).

105. All examples of facts about ourselves.

106. In just one of many examples, in World War II, Allied use of Ultra intercepts that were decoded using the Enigma machine were sometimes not put to good use for fear the Germans would learn of their broken codes. In one of the earliest uses of this intelligence, the Battle of Crete in May 1941, the use of this intelligence source was so hampered by the restrictions around its use that the formidable New Zealanders were overrun by German paratroopers even though decoded transmissions gave every detail of the attack. John Keegan, *Intelligence in War: Knowledge of the Enemy from Napoleon to Al-Qaeda*. (New York: Knopf, 2003), Chapter 5: Crete: Foreknowledge No Help.

capabilities, which increased the uncertainty of our ability to perform a successful first strike,[107] reduced Soviet incentives to attack NATO first.

In many instances, ambiguously crafted doctrine or security policy seems to be taking advantage of this approach as well. For example, unclear or contradictory policy around whether the U.S. allows torture seems designed to make it unclear to the enemy what they may have to face if they are captured.[108] Such disinformation is an example of introduced factual uncertainty only on the side of the enemy, as we do have a policy but have at times lied about it.[109] On another level, this ambiguity is doubtless due at least in part to differing opinions within the U.S. policy-making system, which makes it an inherent factual ambiguity resulting from the complexity of the political system. Finally, it may be—at least by some—a purposeful introduction of factual uncertainty about whether or not the U.S. will torture prisoners, designed to make uncertainty to the other side fully credible by cementing even within our own ranks uncertainty about what actual policy might be.[110]

The previous section mentioned public reaction as an inherent factual ambiguity. One can never be certain what actions or events might capture the public imagination and foment a political movement that has the power to vote politicians out of office, or even topple governments. This might happen politically, for example, by a vote of no

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107. It should be noted that submarine-based Trident missiles probably had sufficient capability from the beginning of the MX program to launch an overwhelming first strike regardless of the status of the MX missiles, so the existing of the MX fleet was simply offering non-mobile targets without increasing capability by very much. Roger Hilsman, *From Nuclear Military Strategy to a World without War: A History and a Proposal*. Nevertheless, the point stands that any decrease of our first strike capabilities (so long as counter-city capabilities were maintained) would be stabilizing regardless of whether that was the case historically. Lawrence Freedman, *The Evolution of Nuclear Strategy*.

108. Indeed, this was the argument of many when public debate about torture first took place in The United States at the height of Operation Iraqi Freedom; Major Christopher B. Shaw, "The International Proscription Against Torture And The United States' Categorical And Qualified Responses," *Boston College International and Comparative Law Review* 32, no. 2 (April 2009): 289–303.

109. Ibid.

110. Both the USSR and the U.S. each had certain projects during the Cold War on which they spent billions despite overwhelming expert opinion that the technologies being researched would never work. This was done in large part to increase credibility that they were on the verge of a breakthrough, thus intimidating their enemies. Brian Michael Jenkins, *Will Terrorists Go Nuclear?* (Amherst, N.Y: Prometheus Books, 2008); Justin Schumacher, "Red Mercury, Real Conspiracies, and Strategic Waste," Medium Homeland Security Collection, accessed February 8, 2015, https://medium.com/homeland-security/red-mercury-real-conspiracies-and-strategic-waste-fe754b968780.

confidence in a political system or wave of overturned incumbents in a representative democracy. In less stable regimes, removals from office could happen by force. Many other such inherent factual ambiguities can be introduced, as well. In one's own country, setting the stage to have specific politicians unseated might provide a strategic advantage in political battles with definite security-policy implications.[111] On the world stage, such uncertainties might be created by supporting or withdrawing support for different coalitions in unstable countries, leaving fewer options for enemies by increasing the possibility of emergent, unwanted results from their actions. This type of strategy was frequently used to brutal effect during the Kissinger years and is emblematic of the Realist school of political thought.[112]

Introducing uncertainty about reality to all involved parties is necessarily going to trickle down into uncertainty of intent, as well, because every individual or government's intent is rooted in and limited by facts on the ground. Thus, introduced uncertainties of intent will be the next category discussed.

C. INTRODUCED UNCERTAINTIES OF INTENT: CREDIBILITY AND BINDING ONESELF

This category of uncertainty is all about credibility. Are one's public pronouncements believable? When should one strive to be credible, and when is it preferable that the enemy is unsure of whether to believe pronouncements about one's intent?

In the early days of the Cold War, Warner Schilling wrote about the problem of acting predictably, ethically, using the parable of the squash court, discussed in Chapter 2. According to this thought experiment, being too predictably adherent to one's moral code is a fatal weakness. Schilling's conclusion was that our only choices were to convince the Soviets that our spite was more powerful than our ethics. By increasing the uncertainty about what were willing to do, we influenced an enemy's decisions from one end of the spectrum, from a point near certainty that we would not possesses the mettle to

111.Lawrence Freedman, *Deterrence*.

112.Thomas Schwartz, "Henry Kissinger: Realism, Domestic Politics, and the Struggle against Exceptionalism in American Foreign Policy," *Diplomacy and Statecraft* 22, no. 1 (March 2011): 121–41.

perform a massive counter-population strike if we'd already lost the war, to an uncertain place in the middle. Even better, according to this philosophy, was the idea of a doomsday machine over which we have no control.[113] This would further increase the credibility of our claim that any first strike would be met with apocalyptic results, but in this case it would do so by reducing uncertainty in the opposite direction, toward a certainty consistent with our claimed intent.

Kahn, as mentioned above, recognized the dangers of such a doomsday machine and recommended a different course. Dancing on the edge of the cliff, metaphorically speaking, increases uncertainty about one's intent by increasing the factual uncertainty of a given scenario. This illustrates the lesson that if one's enemy might be convinced of an intent that you do not want them to be convinced of, anything that forces his opinion in the other direction may be a benefit. This might be accomplished by decreasing certainty about the outcome of a scenario, or by increasing certainty of the opposite conclusion. Either is likely to have the desired effect, but each comes with its own risks.

Just like ambiguity of fact, uncertainty about intent can be introduced only to the enemy or to both one's enemy and oneself. Also like ambiguity of fact, introducing the uncertainty on only the enemy's side may be more useful in that we maintain better understanding of a given situation, but it is less powerful in that it is likely to be less credible.

Uncertainty of intent can be a powerful, if unpredictable, diplomatic tool. It gives one's opponent in any bargaining scenario the opportunity to interpret intent in different ways. The USSR commonly expressed different policies in public than in diplomatic channels.[114] This strategy provides a political out to leaders while demonstrating flexibility to the enemy. Just such a situation occurred in perhaps the most dangerous days of the Cold War. The Cuban Missile Crisis saw the U.S. facing down the USSR over nuclear missiles that had been installed in Cuba. Both sides had talked themselves

113. Roger Hilsman, *From Nuclear Military Strategy to a World without War: A History and a Proposal*, 50.

114.Roger Hilsman, *From Nuclear Military Strategy to a World without War: A History and a Proposal*, 68.

into a corner with statements of inflexibility. At the peak of the crisis, Khrushchev publicly stated on a radio broadcast that the missiles would stay, and a Soviet cable to Kennedy demanded the removal of NATO missiles from Turkey in exchange for the removal of Soviet offensive weapons from Cuba. Only hours later, however, a diplomatic cable to a Soviet KGB officer stationed in New York expressed a different offer and it was quietly relayed to the White House via back channels. In a diplomatic move later termed "Trollope's Ploy,"[115] Kennedy ignored the radio address and the previous cable, instead responding to the dispatch that offered the best way out of the crisis for the U.S. The end result was the Soviets' acceptance of the terms laid out by Kennedy and their withdrawal of all warheads from Cuba, and an end to the crisis.[116]

President Reagan is said to have been skilled at this as well. His rhetoric was filled with oxymora, arguing simultaneously for multiple inconsistent values that allowed for varied interpretation, and multiple policy options consistent with his proposed values.[117]

On a more general level, it is often the case that ambiguous doctrine is developed around specific weapons or styles of war—for example, nuclear weapons—or around geographic areas. One intention of such ambiguous policy is doubtless to provide flexibility, allowing one to respond to unforeseen developments in the future (inherent or introduced factual ambiguities) without having to remake policy. However, another mechanism is also at work: In many cases, leaving the enemy uncertain about what we plan to do confers an advantage.

This is obvious at the most basic tactical level. When performing an arrest, it is common to surprise the suspect. If he does not know what time you are likely to come for him, or which door you plan to enter from, he is left with far fewer options than if he has full knowledge of what you plan to do and when.

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115. So named after a novel by Anthony Trollope in which a young woman purposefully misconstrues words and gestures to her liking. Ibid.

116. Ibid.

117. Michael Weiler and W. Barnett Pearce, eds., *Reagan and Public Discourse in America, Studies in Rhetoric and Communication* (Tuscaloosa: University of Alabama Press, 1992), 128–132.

But as one moves further from the tactical to the strategic realm, unpredictability often becomes much more difficult to maintain and the costs of developing such strategies can increase exponentially. For example, a decision to deploy submarine-based nuclear warheads specifically as a replacement for the MX missile fleet will necessitate the labors of tens of thousands of individuals, billions of dollars in investment, and massive movement of materiel that can be monitored by foreign intelligence agencies. To develop multiple such platforms is a nation-bankrupting expense, as the USSR eventually learned. To do so purely as a ruse would seem senseless. That said, the Strategic Defense Initiative (SDI) cost the U.S. billions of dollars and virtually everyone involved knew—or at least strongly suspected—that it would never work.[118] Some White House aides from that time period claim that the SDI was pursued in large part to force research by the Soviets that would divert spending away from more practical undertakings.[119]

In seeking to apply the lessons of introduced uncertainty of intent to improve counterterrorism, it may be valuable to look at the conditions that made it valuable when facing the Soviets. On a grand strategic level our lack of clarity around when we would and would not respond to violations of containment was classic Schelling-style deterrence, coercion through threat of violence using ambiguity to solve the boundary problem. When dealing with a terrorist group that we believe will respond to deterrence, and for whom we have viable targets, a similar application might be possible.

Given, however, that deterrence is often not an option when facing terrorists, what other ways might we be able to introduce this type of uncertainty? Generally, anytime we are likely to be attacked for specific actions we want to take, it would behoove us to muddy the waters on what we intend to do. In a previous section we discussed torture as one example of a policy ambiguity. During the war in Iraq, many also argued that any specific announced date for withdrawal from Iraq would only embolden terrorists, who would then be encouraged to wait and regroup until U.S. troops pulled out. Uncertainty about the intended completion date of the mission was judged to be an advantage.

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118. Stephen F. Knott, *At Reagan's Side: Insiders' Recollections from Sacramento to the White House* (Lanham, Md: Rowman & Littlefield Publishers, 2009), 106.

119. Ibid.

Any instances in which policy makers want to take a certain action but are loath to do so because of political blowback from allies or enemies might also be a good opportunity to introduce uncertainty. Before such an operation takes place, even a delay of public information about intended objectives may prove beneficial. Afterward, if there is a way to make unclear what the objectives were, doing so might protect our reputation if uncertainty about goals would be less offensive than the truth.

Finally, taking lessons directly from Reagan, we might say that conflicting values confuse the issue of when we will and will not pursue individuals that behave as terrorists but are not universally classified as such. By proclaiming generic support for liberty and self-actualization while at the same time espousing support for peace and the rule of law, it is possible to provide oneself an array of possible actions to take, all of which are consistent with proclaimed values.

The section above on introduced factual uncertainties mentioned that, in many cases, introduced factual uncertainties that apply to all sides of the conflict can be thought of as manufactured versions of inherent system ambiguities. This begs the question: What are examples of inherent ambiguities of intent—not introduced by us—that we might leverage to our advantage? These types of uncertainty are termed inherent uncertainties of intent and discussed next.

D. INHERENT UNCERTAINTIES OF INTENT: TOUGH DECISIONS, SNAP JUDGMENTS AND MADMAN DIPLOMACY

Because they exist in conceptual space—that is, in someone's thoughts—inherent uncertainties of intent are more abstract and more difficult to analyze. The principles of bounded rationality provide an excellent tool to consider them, however, as one's intent is based on one's ability to 1) appropriately bound and understand the situation as it exists; 2) develop and predict outcomes of alternative actions; and 3) weigh the set of predicted outcomes of those alternatives against one another to determine which course of action is likely to yield the most favorable results given the context. In simpler terms, this might be described as understanding context and understanding how decisions one makes will interact with that context. In Snowden's framework from Chapter 3, a

situation that allows for good understanding of all of these means one is dealing with "known knows," which he would later describe as the "simple" realm of understanding in his Cynefin Framework. Unfortunately much of the world in which we operate is far from simple, in the normal use of the word or according to Snowden's model.

In a similar line of thinking, Nobel Prize winner Herbert Simon described the process of rational decision-making as being rooted in the interaction between the external environment (context) and internal environment (our ability to process the information).[120] The complexity of the world we live in necessitates that we work with an incomplete set of data in practically all decision-making. It is simply too difficult to understand all the interactions and secondary effects of most actions we might take. We are therefore often unable to conceive of many possible actions and their outcomes, because our internal limitations are overwhelmed by external complexity. Our ability to make reasoned decisions in a timely manner is thus often severely limited, and highly changeable as new information shifts our perceptions.

The distinction between internal and external environments can be used to outline two different sources of inherent uncertainty of intent, analogues of Snowden's known/unknown matrix.[121] The first is rooted in the external environment, and trickles down from the inherent ambiguities of fact. As one example: if one hopes to attack an enemy this evening, but is unsure of whether the storm this afternoon will wash out roads badly enough to hamper travel, one's intent is likely to remain uncertain until better information comes available. In a rapidly evolving situation—the norm for tactical commanders in battle—decisions must be made quickly. Until that happens, oneself and one's enemy remain uncertain of what intent might be. This can be classified as an inherent uncertainty of intent, applicable to both sides of the conflict.

The second source of inherent uncertainty springs from the cognitive limitations of the decision-makers. These certainly contribute to the systemic uncertainties described

120. Herbert A. Simon, *The Sciences of the Artificial*, 3rd ed (Cambridge, Mass: MIT Press, 1996), 25.

121. This is somewhat of a rough comparison, as Snowden's assessment is less rooted in our perception of the system (as Cynefin attempts to model complexity) than qualities of the system itself, whereas Simon is focusing more on modeling our understanding. Nevertheless, the comparison is useful and there is much overlap.

in the preceding paragraph, but in extreme circumstances an individual's inability to make rational decisions can overwhelm even "good enough" data about non-complex situations. In these cases behavior becomes unpredictable from the perspective of anyone considering the situation from a more reasoned perspective. A leader who is truly insane—or truly daft—is likely, through not having a good grip on the relationship between decisions and their consequences, to behave in extremely unpredictable ways.

History offers countless examples of rulers that had at least a touch of insanity. Ivan the Terrible's "complex personality" was an advantage in that he was one minute a gifted diplomat and the next acting on paranoid delusions, feeding to his dogs anyone who displayed even a hint of disloyalty.[122] Such random brutality is an advantage when building an empire by force, why may help explain why so many dictatorial rulers throughout history appear to have been mentally unstable. In modern times, we like to believe that leaders are rationally selected and make decisions through rational processes. However, because instability and unpredictability can be an advantage, there are still leaders who appear to be a little insane (a contemporary example might be the leadership of North Korea) and many others act that way at times.

Democratic regimes are not immune from this type of leadership. President Richard Nixon in particular was famous for what became known as "madman diplomacy." His National Security Advisor and later Secretary of State Henry Kissinger worked hard to cultivate an image of Nixon as emotionally unstable and unpredictable.[123] In one case, they went so far as to launch eighteen B-52 bombers armed with thermonuclear warheads over the North Pole to threaten an end to the Vietnam war "at all costs."[124] While we now know that most of the more unpredictable actions were a calculated act—that is, they were introduced uncertainties of intent—the success of these tactics illustrates the utility that similar, non-manufactured inherent uncertainties can also offer in the modern age.

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122. Michael Rank, *History's Worst Dictators: A Short Guide to the Most Brutal Rulers, From Emperor Nero to Ivan the Terrible* (Five Minute Books, 2013).

123. Scott D Sagan and Jeremi Suri, "The Madman Nuclear Alert: Secrecy, Signaling, and Safety in October 1969," *International Security* 27, no. 4 (2003): 150–83.

124. Ibid., 150.

Many other possible examples might be cited of the trumpeting of national pride to the point that it is unclear just how far one is willing to go. As with madman-diplomacy strategies, such an approach is setting the stage for unpredictability. In a way it limits one's options by putting them in the hands of unpredictable chance events, in this case the craving of the public for war. A leader can, through antagonistic rhetoric, incite citizens to desire war. This can create a situation in which intent is limited, and shifted day-by-day according to the winds of national politics. Are such actions examples of introduced or inherent ambiguities of intent? If correctly crafted, almost no one knows for sure whether they are inherent and irresistible or wholly manufactured, and it does not make much difference one way or the other. As long as they are credible, advantage can be gained either way.

E. PRINCIPLES OF UNCERTAINTY MANAGEMENT

In ancient Greece, political or military power was understood to take different forms. In its most rudimentary and predictable incarnation, applying the brute force of overwhelming strength to get one's way was known as *bie*. This stood opposed to *metis*, the power of trickery and cunning.[125] Many of the great epics have this dichotomy at their center, epitomized by Achilles and Odysseus at the gates of Troy. Some scholars have gone so far as to say that "to speak Homerically is to speak of a contrast of *bie* and *metis*."[126] This dichotomy is by no means limited to the Greeks. Nearly every historical mythological tradition sets a trickster-type figure against a powerful heroic figure, a trend that has led to the understanding of these figures as the most basic of Jungian archetypes.[127] "The hero and the trickster are the most durable of storytelling figures, ancient, unchanging, adapting to contemporary realities but never the same."[128] There is something fundamental in ourselves that we see in both. The trickster represents our

125. Tyler Krentz. "War Gods in Archaic Greece and Rome." Honors Thesis, Trinity University, 2011.

126. Jenny Strauss Clay, *The Wrath of Athena: Gods and Men in the Odyssey*, 1st pbk. ed, Greek Studies (Lanham: Rowman & Littlefield : Littlefield Adams Books [distributor], 1997): 101.

127. Harold Scheub, *Trickster and Hero: Two Characters in the Oral and Written Traditions of the World* (Madison: The University of Wisconsin Press, 2012).

128. Ibid.

"shameful origins" and a manifestation of our weaknesses as humans. The hero, on the other hand, is our "glorious vision" of ourselves as powerful and in control.[129]

In different times and different cultures, one side or the other is often ascendant. In ancient Greece, an irregular and ever-evolving collection of small city-states surrounded by much larger and more powerful enemies, *metis* was judged by culture and confirmed by myth to be superior. We see this in the ultimate triumph of Odysseus as he faced down a series of mighty adversaries through a variety of clever methods, including binding himself to the mast to avoid the sirens and resigning the field of battle at Troy only to infiltrate the city in a wooden horse.[130]

Ancient Rome serves as a stark contrast. The most powerful nation of their time, they favored *bie* and had a more positive view of war generally. This is illustrated perhaps most dramatically by the role that the god of war through strength, Mars, played in their culture. In Greece, Ares—roughly equivalent to Rome's Mars—was referred to as despicable and considered secondary to the crafty goddess Athena. Mars, in contrast, held an "esteemed central position" in Roman society.[131]

The U.S. has its own share of myths, but benefits from a context that informs Americans' valuation of these classical archetypes. Largely insulated from any powerful enemies geographically since the nation's founding, U.S. citizens have recently enjoyed more than two generations of worldwide hegemony.[132] Our military capabilities are designed to defeat two major powers simultaneously in different parts of the world. For some of the last fifty years we had one powerful enemy, though never two; our military superiority has been clearly dominant for most of the time since World War II and

129. Ibid.

130. Virgil and Robert Fitzgerald, *The Aeneid* (New York: Vintage Books, 1990).

131. Tyler Krentz. "War Gods in Archaic Greece and Rome."

132. "Hegemony" is used here to refer to a position of unquestioned dominance. Some political scientists use the term differently, however, and would argue that the U.S. has never been a worldwide hegemon except perhaps for a few years after the end of World War II in which only Americans had access to nuclear weapons, as there were always great powers that could challenge us. John J. Mearsheimer, *The Tragedy of Great Power Politics*, Updated edition, The Norton Series in World Politics (New York: W.W. Norton & Company, 2014).

unquestionable for the last sixty years.[133] In addition, many other nations around the world have looked to the U.S. to settle disputes or maintain peace when they were unable to do so. As a result, the U.S. has become accustomed to relying on *bie* as its go-to method of wielding power. This tendency has been reinforced by Americans' justified devotion to transparency and predictability in governance, and by a calcified understanding of America's place of unquestioned power.[134]

Although the U.S. still possesses more military might than the rest of the world combined, its overreliance on *bie* as the de facto solution to security problems illustrates a failure to adapt to the evolving nature of warfare. Terrorist-type attacks have proven difficult to predict, prevent or deter. The asymmetric nature of terrorism, evolved to deal with the overwhelming dominance of American forces in traditional warfare, is incredibly difficult to defeat using only overwhelming capabilities—be they intelligence, economic or direct military action. Perhaps part of the solution can be found in the tools of ambiguity. Recognition of the limitations of clear and obvious dominance, and harnessing the power of *metis* by embracing existing uncertainties and manufacturing new ones, may offer advantages that are not currently recognized.[135]

Any cohesive strategy that employs ambiguity to counter security threats must first attempt to outline the types of circumstances in which this type of tool may be useful. To start we must consider what is necessary for an enemy to pose a threat. At its most basic, people attack when they have: 1) a desire to do harm, 2) the capabilities to do so successfully, and 3) a belief that the benefits of attacking, with their given capabilities and our given defenses, are likely to be greater than the costs. Without all three conditions, an attack is unlikely to occur, so removing any of these three criteria is usually sufficient to provide protection.

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133. Roger Hilsman, *From Nuclear Military Strategy to a World without War: A History and a Proposal*, 60.

134. This is also consistent with historical patterns. "Deception is frequently a weapon of the weak. The strong are generally more relaxed, unsystematic and arrogant in their approach to war against the week, thus giving the latter a badly-needed advantage in the war of deception." John Gooch and Amos Perlmutter, *Military Deception and Strategic Surprise* (London; Totowa, N.J.: F. Cass, 1982), 1.

135. "As a form of "trickery" [deception] has acquired a pejorative connotation … but strategic deception, far from being ungentlemanly or random, is a systematic and consistent process in which success may bring substantial benefits." Ibid.

Convincing enemies they have no desire to attack is ideal in that it solves the problem at its root, but as that approach often fails other alternatives must be considered. Countering an enemy's ability to attack might be accomplished directly by destroying his offensive capabilities, or by increasing one's own defensive capabilities beyond what the enemy is able to overcome. One might also diminish the enemy's capabilities indirectly through economic sanctions or eliminating sources of support, either of which can be accomplished through any of the above methods. Finally, persuading an enemy that the costs of an attack are not worth the benefits comes down to the classic concept of deterrence,[136] and can be accomplished by a combination of defensive measures and/or threats of retaliation, thus changing either or both sides of the equation. Figure 2 illustrates the variety of options that are available.[137]

136. The eminent military historian Lawrence Freedman describes deterrence as a "coercive strategy," involving the "potential or actual application of force to influence the action of a voluntary agent." This can be done in a variety of ways, and is entirely consistent with Schelling and Kahn. Lawrence Freedman, *Deterrence*.

137. This figure taken from a Davis and Jenkins' monograph on deterrence of terrorism. Paul K. Davis and Brian Michael Jenkins, *Deterrence & Influence in Counterterrorism: A Component in the War on Al Qaeda*.

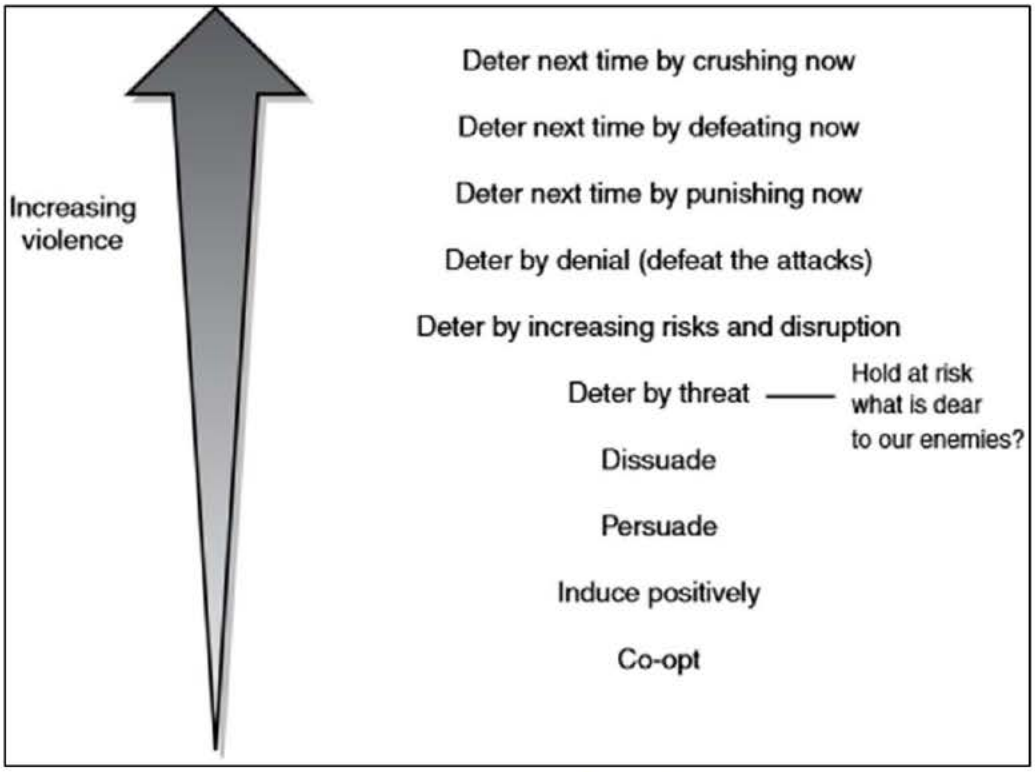

Figure 2. The escalation ladder of deterrence

In considering historical nation-states, all of these methods have proved effective at one time or another. Over time a country tries to minimize enmity through treaties, diplomacy, and economic integration, all usually forms of co-option. Having capable defenses ensures that an enemy would not be able to successfully attack without a significant outlay of resources, as overcoming defensive fortifications would require massive capabilities. This changes the calculus and renders the attack no longer worth the sum of 1) the outlay of resources required to attack; and 2) the cost of the expected response. Finally, through economic sanctions and targeted smaller attacks, countries work to minimize the capabilities of their known enemies.

The modern age shifted this formula somewhat. It became far easier for a nuclear power to unleash massive destructive capabilities without putting much at risk in the way of their own resources, and defensive fortifications became less important as there was virtually no way to protect a city from nuclear missile attack. The rise of modern nation-states also made unacceptable even small attacks that people in previous eras could have

written off,[138] and technological advances made it easier for lone actors to achieve more spectacular attacks. Taken together this makes it much more difficult, if not impossible, for an open society to prevent unacceptable levels of casualties simply by spending more on defensive measures, even for non-nuclear attacks.[139] Deterrence thus became the order of the day, and remains a key part of our approach to security to this day.[140]

When facing nation-state enemies, deterrence is relatively simple because good deterrence targets are numerous and obvious, and often important to no one but the enemy. A powerful nation therefore has little problem with the capability to attack, understanding what is important to the enemy, or maintaining the will to do so. As discussed in Chapter 2, however, with terrorists this is often impossible because terrorist organizations tend to present fewer targets, and few at all that can be hit without damaging the interests of those we rely on for support. For a modern superpower trying to maintain the moral high ground and prevent future attacks as well as immediate ones, true deterrent strikes are simply not an option much of the time.[141]

This limits the menu of possible of options in preventing terrorism to removing the motivation to attack us; deterring through other means than threats of destruction of critical targets; or by decreasing their capabilities, either through direct attacks or by removing vectors of support. As would be expected of any nation with a culture that favors a *bie* approach to power, the U.S. appears to have focused its energy on building better defensive systems, and rooting out terrorists using superior intelligence capabilities then destroying them using superior military technology. But when dealing with an enemy that does not rely on strength or defensive fortifications, and holds dear only things that are also important to our allies, we are left with few options. In such a

138. Phillip Bobbit, *Terror and Consent*.

139. "Prevention is extremely difficult and unlikely to be foolproof … the goal of making the citizens and infrastructure of The United States impenetrable is practically impossible." Tippet, "Deterring Terrorism."

140. Department of Defense, "Joint Publication 5–0", page III-42.

141. "True deterrence" in this context means as opposed to preventive strikes that destroy an enemy's capabilities, or deter a supporting nation from supporting the terrorist group. Not everyone agrees on this point. See Tippet, referenced earlier, for a perspective on how to use massive attacks as a deterrent against terrorists. Tippet, "Deterring Terrorism."

situation it may behoove us to employ more *metis* ourselves and, like Odysseus, resort to trickery when necessary, binding ourselves to the mast when the situation warrants or resigning the field to gain a different type of advantage.

F. SUMMARY OF AMBIGUITY AND UNCERTAINTY IN COUNTER-TERRORISM

This chapter has looked at four classes of uncertainty, based on the previous section's distinction between inherent and introduced uncertainty, and uncertainty of intent versus uncertainty of fact. At times distinctions were also made between uncertainties that we introduce only to the enemy, which overlap largely with disinformation. At other times, we considered uncertainties that degrade our own knowledge along with our enemy's. Any of these may offer advantages in specific circumstances.

V. ETHICAL AND LEGAL IMPLICATIONS

The previous chapters outlined the weakness of terrorism studies as opposed to nuclear deterrence theory, described in some detail the defining characteristics of ambiguity and uncertainty, and presented some examples of how uncertainty might be leveraged as an advantage in counterterrorism policy.

But as with many areas of public policy, simply because an approach helps meet an objective does not mean that its application is necessarily a positive development. In security policy particularly, the strategic objective of a nation safe from attacks must be balanced against the many other goals that make the nation worth protecting.

The leveraging or introduction of uncertainty in counterterrorism policy presents three immediate risks that must be recognized: legal constraints, ethical concerns, and cultural effects. Each of these is discussed briefly in the following pages.

A. LEGALITY AND AN OPEN SOCIETY

As World War II came to a close in 1945, philosopher Karl Popper published *The Open Society and Its Enemies,*[142] which would come to define how modern Western nation-states saw themselves. Popper's influential political treatise represented a battle of political ideals that would parallel the nuclear conflict described in chapter two for the same fifty-year period. It is telling that the book begins with a quote by Pericles: "Although only a few may originate a policy, we are all able to judge it."[143] Although "transparency" was not yet a term in vogue, the idea behind Popper's entire two-volume work was that a government with transparent policies, open to analysis and changeable if necessary by the population at large, was the only path away from totalitarianism. The second volume focused on the shortcomings of Marxism in particular and social

142. Popper, Karl R. *The Open Society and Its Enemies. Volume 1: The Spell of Plato*. 1st ed. 2 vols. London: Routledge, 1945.

143. Ibid., 5.

engineering in general because, Popper argued, societal evolution is too complex and unpredictable to be engineered.[144]

Although the ideals of an open society in its modern incarnation were formalized by Popper, the idea of open government is a foundational aspect of democracies throughout history. "One of the most notable achievements of Athenian democracy in ancient times was its establishment of civilian oversight of public funds and the wealth and incomes of all public figures (including generals), so that they did not benefit from their public positions."[145] Transparent policies and comprehensible procedures for their development have been characteristic of successful democratic societies ever since, which is necessary both for stable governance[146] and healthy economic growth.[147] This was recognized for the U.S. by its founding fathers, who designed a government full of checks and balances to ensure deliberate rule-making, and subsidized newspaper distribution to ensure an informed populace.[148] "However firmly liberty may be established in any country, it cannot long subsist if the channels of information be stopped," wrote Elbridge Gerry, in arguing for newspaper subsidies in 1792.[149] Efforts to maintain transparency have precipitated the creation of laws at every level of government

144. Popper, Karl R. *The Open Society and Its Enemies. Volume 2: Hegel, Marx and the Aftermath*. 1st ed. 2 vols. London: Routledge, 1945

145. "Accountability and Transparency: History." *Democracy Web: Comparative Studies in Freedom*. Accessed January 24, 2015. http://www.democracyweb.org/accountability/history.php.

146. James R. Hollyer, B. Peter Rosendorff, and James Raymond Vreeland. "Democracy and Transparency." *The Journal of Politics* 73, no. 04 (2011): 1191–1205. doi:10.1017/S0022381611000880.

147. Roumeen Islam, "Do More Transparent Governments Govern Better?" Policy Research Working Paper. Poverty Reduction and Economic Management Division, *The World Bank Institute*, June 2003.

148. Richard Perez-Pena. "A Reminder of Precedents in Subsidizing Newspapers." *The New York Times*. January 27, 2010. http://www.nytimes.com/2010/01/28/business/media/28subsidy html.

149. Paul Blumenthal. "History of Transparency--Part 1: Opening the Channels of Information to the People in the 18th Century." Sunlight Foundation, March 23, 2010. http://sunlightfoundation.com/blog/2010/03/23/the-history-of-transparency-part-1-opening-the-channels-of-information-to-the-people-in-the-18th-century/. Elbridge Gerry signed the Declaration of Independence and the Articles of Confederation, and was one of three who refused to sign the Constitution without the Bill of Rights. He served as Massachusetts' governor and congressman, and later served as Vice President of The United States.

that ensure the public has access to information on policy and to the debates on why the policies are put in place.[150]

The first challenge to any implementation of deliberately ambiguous security policies is the letter and spirit of these transparency laws. While some methods of introducing uncertainty doubtless pose no challenge to these laws, others may prove problematic. If one were to try to use techniques touched upon in the preceding chapters, a thorough analysis of legal requirements would be a necessity.

B. ETHICS AND UNCERTAINTY

Closely related to the problems of legality are the ethical questions likely to be raised if the U.S. were to start leveraging ambiguity or injecting uncertainty into security policies. This type of challenge is broader in scope, and more a more difficult question on which to rule definitively.

As with most ethical dilemmas,[151] the question of how much uncertainty might be leveraged without straying into unethical behavior is actually a conflict between two accepted moral imperatives.[152] Specifically, those who craft security policy have a responsibility to maintain transparent governance, but also to maintain the greatest possible level of security for the American public.

The use of ambiguous policies, even when legal, may at times still be judged unethical. Like other dilemmas faced by security practitioners the law is a good starting point in addressing this issue, but one must also weigh potential gains against past practices and public expectations of behavior. There are many ethical frameworks one

150. Ginsberg et al describe a cross-section of laws, rulings and executive orders that undergird transparency in US law. Wendy Ginsberg, Maeve P. Carey, L. Elaine Halchin, and Natalie Keegan. "Government Transparency and Secrecy: An Examination of Meaning and Its Use in the Executive Branch." Congressional Research Service, November 14, 2012. https://www.fas.org/sgp/crs/secrecy/R42817.pdf.

151. *The Stanford Encyclopedia of Philosophy* defines a moral dilemma as a "conflict between moral requirements."

"Moral Dilemmas." *Stanford Encyclopedia of Philosophy*. Stanford, CA: Stanford University, n.d. http://plato.stanford.edu/entries/moral-dilemmas/.

152. Wendy Ginsberg et al, "Government Transparency and Secrecy: An Examination of Meaning and Its Use in the Executive Branch, "8.

might employ to make such judgments, and most fall clearly into one of two categories: deontological (rule-based ethics) or consequential (judging actions by their consequences). Discussions of nuclear deterrence may again be helpful in this consideration, as much has been written on the ethics of deterrence. Summarized by Steven Lee, "The consequentialist argument shows nuclear deterrence to be morally required, whereas the deontological argument shows nuclear deterrence to be morally prohibited."[153] This is the case because deterrence, like purposefully ambiguous security policy, goes against how we expect government to ethically behave. However, a consequentialist argument would exonerate both types of policy (deterrence and ambiguity) on the grounds that the result of such policies should mean a safer world.[154]

Specific routes out of the dilemma are myriad, but often rely on weighing the varying ethical prescriptions against one another. This approach is at least as old as Plato, who wrote in the *Republic* of whether one has the duty to return a friend's weapon when he is out of his right mind.[155] In this example, it is clear to most that the consequentialist argument (great harm may come from doing so) clearly outweighs the deontological argument (I should return my friend's property when he asks). Multiple individuals, operating within different paradigms and according to different ethical systems, might be able to make such an evaluation more reliably than one person alone. This method would be in line with the arguments of John Rawls, one of the pre-eminent political and moral philosophers of the last century. In *Political Liberalism,* Rawls argues that legitimacy of government action can be maintained only if policies are consistent with an "overlapping consensus" of what a significant portion of the diverse public finds appropriate.[156] Though this sounds complicated, in many cases it may be as easy as considering, from

153. Steven Lee, Morality, *Prudence, and Nuclear Weapons*, (Cambridge [England]; New York, NY, USA: Cambridge University Press), 1996, 59.

154. It should be noted that consequentialist arguments alone, without being bounded by rights theory or some other mechanism, can be used to condone any number of heinous policies if they achieve positive outcomes.

155. Plato, *The Republic*. Indianapolis: Hackett Pub. Co, 1992, 6.

156. John Rawls, *Political Liberalism*. Expanded ed. Columbia Classics in Philosophy. New York: Columbia University Press, 2005.

multiple perspectives, how likely the public would be to find a given policy acceptable should they understand both the policy and its context.

Using this approach, a final determination of the ethics of deliberately ambiguous counterterrorism policy must therefore be considered on a case-by-case basis. Any particular application of the utility of ambiguity should be weighed, on its own merits, according to different ethical systems. Comparing the moral obligations from each against Rawls's "overlapping consensus" should yield answers that, most of the time, are the correct moral positions for government to take. This is simple enough when considering tactical or narrowly scoped policies of ambiguity, but requires a much broader discussion when it is to be employed as doctrine.

C. CULTURE AND UNCERTAINTY

Culture resides at even more of a macro level than legality or ethics. As such its scope is incredibly broad, and the uncertainty around how to weigh cultural effects of policy is even greater than when discussing ethics. Even when a decision to propagate ambiguous policies is deemed both legal and ethical, one must consider how consistent it is with the cultural context, and what far-ranging effects it might have via the mechanism of culture.

There are many definitions of culture. Esteemed cultural anthropologist Alfred Kroeber's is one of the more thorough and relevant for this examination:

> Culture consists of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts; the essential core of culture consists of traditional (i.e., historically derived and selected) ideas and especially their attached values; *culture systems may, on the one hand, be considered as products of action, and on the other as conditioning elements of further action*.[157] [Emphasis added.]

This definition recognizes both that culture creates expectations of how we should behave, and that culture is constantly remanufactured by the actions that we take. Each of

157. A.L. Kroeber and Clyde Kluckhohn, *Culture: A Critical Review of Concepts and Definitions*. 1st ed. Vintage Books, 1963.

these aspects of culture poses a risk when one creates policy that is inconsistent with established cultural expectations.

The section on legality above offered evidence of the esteemed place that transparency has in American democracy. Open government laws exist because of the widespread understanding that such openness is a fundamental and necessary quality of American government. Citizens expect that those making decisions about how to manage the nation's affairs will be open and honest to the greatest degree possible. When this expectation is not met, trust in government erodes and it becomes more difficult to meet the full spectrum of responsibilities given to policy makers. Lower levels of trust lead to greater rates of lawbreaking, tax evasion, political apathy, and radicalization.[158]

If unnecessary failures to govern transparently can erode trust, thus shifting culture through action, the feedback loop described by Kroeber says that a shift in culture away from trust and legitimacy can be expected to then spur further violations of trust. Some secondary violations of trust are bound to be less anodyne, less honorable, and more caustic. In its worse forms, this cycle creates a "security trap" whereby those in power use the authority of government to entrench their own interests. Bad behavior and self-interested decisions become fully incentivized, crime rises and corruption becomes rampant.[159] This vicious cycle is one that must be avoided if at all possible.

Luckily, while our culture values transparency it values security highly as well and this is reflected in the public discourse. The clash between these tenets has been on display recently in the public debate about Edward Snowden[160] and the NSA handling of

158. Hoover, Kenneth R. *The Elements of Social Scientific Thinking*. 10th ed. Boston, MA: Wadsworth Cengage Learning, 2011, Appendix B.

159. A milder form might be currently observed in the power of money in politics in The United States, and in the corruption of government officials observed in Virginia, Illinois and Oregon in this decade alone. John Bailey of Georgetown University has written much on the more serious forms of this security trap in Latin America. John Bailey, *The Politics of Crime in Mexico: Democratic Governance in a Security Trap* (Boulder, Colo: FirstForumPress, a division of Lynne Rienner Publishers, Inc, 2014).

160. Mike Krumboltz. "Is Edward Snowden a Traitor or a Hero? The Debate Continues." Yahoo News, January 17, 2014. http://news.yahoo.com/is-edward-snowden-a-traitor-or-a-hero--the-debate-continues-200122522 html.

phone records.[161] Although there is much vehement disagreement, it appears that Americans seem to believe the system usually works well. Americans have higher levels of faith in their government doing the right thing "most of the time" than citizens of most other countries, including other wealthy democracies.[162] The military and law enforcement in particular are held in high regard in the U.S., more trusted than the medical system or even churches.[163]

As policy makers, we must therefore work to manage cultural expectations, expressing and demonstrating adherence to the American values of transparency whenever possible. This should, in theory, allow us the space to spread uncertainty when necessary to increase security. As a genuinely practical populace, Americans can be expected to be understanding of such a balance being struck as long as it is done thoughtfully and with regard to secondary impacts.

D. CONCLUSION: BALANCING OF THE RISKS

Legal, ethical and cultural concerns having been considered, the final valuation is that ambiguous security policies, when employed to counter security dangers such as terrorism, are likely to be acceptable. Before implementation, however, any such policy must be examined by numerous individuals with varied backgrounds in law and ethics to ensure they are worth the costs. Those costs may be as clear-cut as minor violations of law or as amorphous as secondary cultural impacts sometime in the future. Careful analysis is important, and might follow the example set by theorists who have written volumes on the impacts of deterrence.

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161. Eileen Sullivan, and Steve Peoples. "Debate over NSA Spying Makes for Political Odd Couples." *Denver Post*. February 18, 2014. http://www.denverpost.com/nationworld/ci_25168832/debate-over-nsa-spying-makes-political-odd-couples.

162. Kenneth R. Hoover, *The Elements of Social Scientific Thinking*, 10th ed (Boston, MA: Wadsworth Cengage Learning, 2011), Appendix B.

163. Gallup Historical Trends. "Confidence in Institutions." Gallup Polls, 2014. http://www.gallup.com/poll/1597/confidence-institutions.aspx.

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VI. CONCLUSION

The previous chapters have presented a case that the United States, and other powerful Western-style democracies, can gain advantage from harnessing the power of ambiguity and uncertainty. This argument first outlined the weakness of terrorism studies as opposed to nuclear deterrence theory, then offered defining characteristics of ambiguity and uncertainty. Finally, examples of how uncertainty might be leveraged as an advantage in counter-terrorism policy were presented and examined in light of legal, ethical and cultural concerns.

Developing general principles around such an amorphous topic is an ambitious task, but based on the research presented in this thesis the following appear to be true:

1. Ambiguity is present in many ways in nearly every situation we find ourselves. Being aware of it, we may be able to leverage it to our advantage.
2. In certain situations, introducing new or additional uncertainty or ambiguity can create a strategic security advantage.
3. When it is clear that the enemy can be defeated openly and transparently, it behooves an open society to maintain openness and transparency because ambiguity carries with it a variety of risks.

If these conclusions are true, another emerges from them:

4. The larger the security risk that one is facing from an enemy, the more likely that the introduction of ambiguities will be worth the risk if it can be shown to provide advantages.

This conclusion is also strengthened by other circumstantial evidence presented in this thesis. The time during which the U.S. faced its most critical security threats in modern history corresponded with the peak of interest in, study, and practical application of information and game theory as applied to security policies.

Further research appears to be warranted to determine the efficacy of the application of ambiguity in the manner presented here, and whether this thesis' final conclusion is valid. Measuring the threat posed by an enemy would appear to be a challenge, but some scholars have developed metrics that may be helpful. For more classical projections of military power, offensive realist John Mearsheimer discusses how

one might measure power,[164] which one must then combine with some measure of intent. As discussed in the above chapters, however, traditional measures of power and threat do not often translate well to non-state terrorist organizations. For this reason it may be worth considering other approaches, such as the "3-S Model" presented in *Special Warfare* by Major Douglas Mills.[165] By estimating not only the scale and scope of a terrorist group's capabilities, but also its reach and motivations, such a perspective would likely provide much more accurate valuations of when a strategy of ambiguity may be helpful. If the arguments of this thesis are correct, terrorist groups that score highly on Mills' 3-S model would be prime candidates for the use of ambiguous counterterrorism policies.

164.John J. Mearsheimer, *The Tragedy of Great Power Politics*.

165. Major Casey Mills, "3S -- Scale, Scope, Salience: A New Model for Evaluating Terrorist Threats." *Special Warfare* 27, no. 4: The Academic Issue (December 2014): 15–21.

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